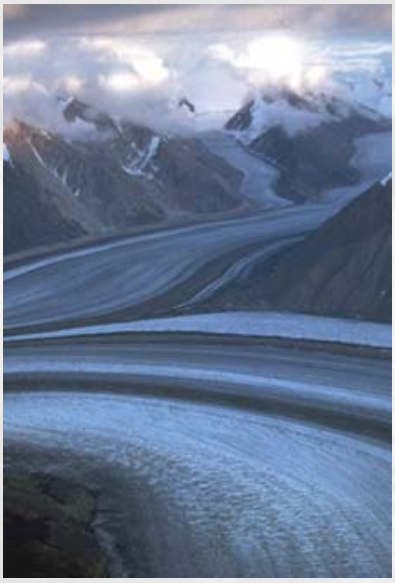
KLUANE

NATIONAL PARK AND RESERVE OF CANADA

Strategic Environmental Assessment Of the Management Plan



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APPROVAL

A workshop was held January 8-9, 2001 to identify the likely environmental impacts of key actions proposed in the draft Kluane National Park and Reserve of Canada Management Plan. The following individuals attended and participated in the workshop:

Ken Anderson	Kluane Park Management Board
Doug Clark	Parks Canada, Yukon Field Unit
Tom Elliot	Parks Canada, Yukon Field Unit
Sarah Gaunt	Champagne and Aishihik First Nations staff
Kim Henkel	Parks Canada, Yukon Field Unit
David Henry	Parks Canada, Yukon Field Unit
Elizabeth Hofer	Kluane Park Management Board
Anne Landry	Parks Canada, Yukon Field Unit
Steve Oates	Parks Canada, Western Canada Service Centre
Catherine Walton	Kluane Park Management Board
Duane West	Parks Canada, Yukon Field Unit

PREPARED BY:

28 January 2002
date

Steve Oates
Environmental Science and Assessment Coordinator
Western Canada Service Centre - Vancouver

APPROVED BY:

A/FUS.

April 02/02
date

Ken East
Superintendent
Yukon Field Unit

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1.0 Introduction

The last management plan for Kluane National Park and Reserve of Canada (hereafter Kluane NP&R) was approved in 1990. Significant changes have occurred since then. Comprehensive Land Claim Agreements have been reached with the Champagne and Aishihik First Nation and the Kluane First Nation. Kluane NP&R occupies portions of the traditional territories of these First Nations. A park management plan review was initiated in 1997. The planning team included representatives from the Kluane National Park Management Board, Champagne and Aishihik First Nations, Kluane First Nation, and Parks Canada. Opportunity for public comment and review of management planning issues was provided through the Kluane National Park and Reserve website http://parkscan.harbour.com/kluane/, five newsletters, open houses in Yukon communities, stakeholder meetings, a student workshop, and a questionnaire distributed to several hundred people in local communities. This strategic environmental assessment report documents environmental effects likely to occur during implementation of the revised Kluane National Park and Reserve of Canada Management Plan.

1.1 Park Management Planning Process

A management plan is a strategic document defining how a national park will be managed. It describes programs and initiatives used by Parks Canada to realise the primary management objectives of ensuring protection and presentation of heritage resources. The plan provides a framework for setting work-planning priorities and a context for resolving park management issues as they arise.

A revised management plan for Kluane NP&R has been prepared based on input from the public, stakeholders, the planning team, and First Nations. A final revised management plan for the park is expected to be tabled in the House of Parliament in the latter part of 2001. Upon approval it will guide decision-making for 5 years. Subsequent management plan reviews will occur at 5 year intervals as specified by the *Parks Canada Agency Act*. Any plan amendments will also be tabled in Parliament.

Annual business plans will be the main means by which management plan initiatives are implemented. Progress in achieving ecological integrity at Kluane NP&R will be monitored. Results will be documented in State of Protected Heritage Areas Reports, formerly State of Parks Reports. These are prepared every few years. The most recent report, *State of Protected Heritage Areas 1999*, is available from the Parks Canada website at http://parkscanada.pch.gc.ca/library/SOP/main_e.htm

1.2 Environmental Assessment Policy and Legislation

The *Canadian Environmental Assessment Act (CEAA)* is the main piece of federal environmental assessment legislation in Canada. Preparation of a park management plan does not trigger the CEAA. However, a cabinet directive, the *Environmental Assessment Process For Policy and Program Proposals (EAPPPP)*, does commit government to assess the environmental consequences of federal plans, policies and programs. A revised version of the directive was approved in 1999. It includes guidelines for implementing the directive as well as methodological information on conducting strategic environmental assessments. The objective of the process is to integrate environmental considerations into the planning and decision-making processes of government. Strategic environmental assessment review of a management plan assesses the probable environmental impacts of implementing proposed key actions. It is also an opportune time to assess cumulative environmental effects.

Following approval of the *Kluane National Park and Reserve of Canada Management Plan*, individual projects will be developed and implemented. These projects will be screened to determine associated environmental effects pursuant the *Canadian Environmental Assessment Act*, or successor legislation such as the *Development Assessment Process / Yukon Environmental and Socio-economic Assessment Act (DAP / YESAA)*. A key purpose of the *CEAA* is to help the federal government achieve the goal of sustainable development. The Act applies to projects where a federal authority proposes, funds, regulates, or grants land. Parks Canada is a federal authority as defined in the *CEAA* and

conducts many environmental assessments each year. An up to date list of projects subject to the *CEAA* is available on the Parks Canada Internet site at http://www.parkscanada.gc.ca/ceaa/english/pcea_e.htm Kluane National Park and Reserve projects can be located by using the 'Search by National Park' function and selecting 'Kluane National Park Reserve' from the drop-down *list. The Canadian Heritage Procedures for Complying With The Canadian Environmental Assessment Act*, and *Parks Canada Management Directive 2.4.2 Impact Assessment*, provide further direction on departmental application of the *CEAA, EAPPPP* and other environmental assessment tools.

1.3 Parks Canada Policy

The *Kluane National Park and Reserve of Canada Management Plan* proposes numerous key actions. Strategic environmental assessment of the management plan included an analysis to determine if proposed actions are consistent with federal policy and legislation governing national parks. Table 2 (see Appendix 1) documents this analysis in detail. *Parks Canada Guiding Principles and Operational Policies (1994)*, provides a policy framework for all Parks Canada programs. Operational policy components relevant to the management of Kluane National Park and Reserve include *National Parks Policy, Cultural Resource Management Policy,* and *Canadian Heritage Rivers System Policy.* The objectives of each of these is briefly described below. Consult the *Parks Canada Guiding Principles and Operational Policies* document for a more thorough discussion of policy.

National Parks Policy objective:

"To protect for all time representative natural areas of Canadian significance in a system of national parks, and to encourage public understanding, appreciation, and enjoyment of this natural heritage so as to leave it unimpaired for future generations."

National Parks Policy provides direction on management planning and resource protection:
"Management plans provide the framework for decision-making within each park. The National Parks Act requires public consultations during the preparation of park management plans and stipulates that the maintenance of ecological integrity through the protection of natural resources will be the first priority when considering park zoning and visitor use."

Canadian Heritage Rivers System Policy

The 90 km section of the Alsek River within Kluane National Park and Reserve was designated a Canadian Heritage River in 1986.

Objective:
"To foster protection of outstanding examples of the major river environments of Canada in a cooperative system of Canadian Heritage Rivers, and to encourage public understanding, appreciation and enjoyment of their human and natural heritage."

Cultural Resource Management Policy objective

"To manage cultural resources administered by Parks Canada in accordance with the principles of value, public benefit, understanding, respect and integrity."

1.4 Parks Canada Legislation

Passage of the *Canada National Parks Act* in 2000 consolidated and revised the *National Parks Act* and strengthened Parks Canada's commitment to ecological integrity. Whereas the *National Parks Act* required consideration of EI in park management planning, the *Canada National Parks Act* now requires its consideration in all aspects of park management. Section 8(2) of the *Canada National Parks Act* states: "8 (2) 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* defines ecological integrity in the following manner:

> "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."

2.0 Environmental Assessment Methodology

On January 8-9, 2001 a workshop was held to identify probable environmental effects of implementing the *Kluane National Park and Reserve of Canada Management Plan*. Representatives from the Champagne and Aishihik First Nations, Kluane Park Management Board, and Parks Canada participated in the workshop. The EA review focused on identification and assessment of key actions capable of generating environmental effects. Positive and negative impacts as well as socio-economic effects were considered. Assessment methodology involved review and evaluation of all key actions proposed in the November 15, 2000 draft management plan. Proposals thought to have potential to generate significant environmental effects were discussed and documented in greater detail. Workshop discussions were recorded on flip charts and personal copies of the draft plan. Minor additions, deletions and wording refinements have occurred to the key actions since the review. The scope of change is considered insignificant as for the most part the intent and number of key actions has not changed substantially. Please refer to the June 2001 draft *Kluane National Park and Reserve of Canada Management Plan* for complete descriptions of key actions and related background information.

Additional impact analysis was undertaken by the author of this report subsequent to the workshop. Summarized results of the assessment are presented in the main text of the report organized by the topical groupings listed in the following section. Detailed environmental assessment analysis and findings are documented in Table 2: Potential Effect of Key Actions. The table also contains suggested means to avoid or mitigate impacts and recommended courses of action where appropriate.

Boundaries

Kluane NP&R is located in the southwest corner of the Yukon Territory. It shares borders with other Canadian and American protected areas as part of the UNESCO Kluane/Wrangell-St Elias World Heritage Site. Many of the key actions proposed in the management plan will directly or indirectly impact areas outside the border of Kluane NP&R. The greater Kluane ecosystem is therefor considered to be an appropriate geographic boundary for this assessment.

Five years from the approval date of the revised management plan is a suitable temporal boundary for the assessment. The next management plan review will commence at that time and most of the initiatives in the 2001 plan will have been implemented. Although the next review is scheduled to occur in 5 years, the revised plan is expected to guide management of Kluane NP&R for the next 10-15 years.

3.0 Impact Analysis and Evaluation

More than 130 key actions are proposed in the *Kluane National Park and Reserve of Canada Management Plan*. Proposed actions respond to stressors threatening park ecological integrity, the need to recognize First Nations rights, and unrealised opportunities to enhance visitor services and park operations. Table 1: Key Action Summary lists the numbers of key actions contained in various sections of the management plan. Please refer to Table 2: Potential Effect of Key Actions for detailed impact analysis of individual key actions in the *Kluane National Park and Reserve of Canada Management Plan*.

Stressors

Stressors can lead to changes in existing conditions. These impacts can be direct, indirect or cumulative. Changes may operate at different levels, vary over space and time, and be either positive or negative. Direct impacts refer to changes in cultural or natural components which result from direct cause-effect interactions between project activities and the cultural or natural environment. Indirect impacts result from cause-effect interactions between direct impacts and the cultural/natural environment. Cumulative impacts result from accumulated changes to the environment caused by human activities.

The management plan identifies the major stressors acting on the park and regional ecosystem. Appropriate indicators of ecological integrity have been established and targets prescribed. Ecological monitoring goals and the Ecological Integrity Statement (EIS) are incorporated into the management plan. The EIS is a key document outlining necessary steps and approaches to monitoring and assuring attainment of ecological integrity in the park. Research has been initiated to increase knowledge on effects of stressors on the ecosystem.

Wildlife

Several authors reporting on work conducted in Kluane NP&R state the combined effects of human hiking and rafting through key corridor habitats is likely approaching a threshold level. Any increased level of human activities during the active season for grizzlies is likely to negatively impact the bear population (reduced habitat effectiveness; increased habitat fragmentation; decreased reproductive success; increased mortality) and may eventually make the population vulnerable to decline or elimination if corrective actions are not implemented. Easy access to core security areas is one of the most important factors in sustaining viable grizzly bear populations. The park has recognized the need to preserve areas where grizzlies are able to avoid human encounters. Zoning in the revised management plan provides a much larger zone 1 special preservation area for bear security. Humans are not restricted from travel in all portions of the zone. However spatially and temporally managed core security areas are in place which do prohibit human travel. Additional management methods, such as mandatory use of bear-proof food canisters, are in place within zone 1 areas where human travel is permitted. Monitoring the effectiveness of these measures is crucial to ensure the desired results (reduced number of bear management actions; reduced bear-human encounters; reduced property loss; stable or increased grizzly bear population) are achieved. Monitoring results should be employed to refine management methods in an adaptive management approach that stresses a conservative, precautionary approach to decision-making. If monitoring indicates thresholds are regularly exceeded, failure to modify human use patterns may make the grizzly population unsustainable.

Implementing the key actions in the management plan is not expected to result in any direct loss of wildlife habitat. No native mammal species in Kluane are listed as endangered or threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Grizzly bear is ranked as a 'species of special concern' which is defined as:

> "a wildlife species that is of special concern because it is particularly sensitive to human activities or natural events, but does not include an extirpated, endangered or threatened species".

Fish productivity is low in oligotrophic, northern, subarctic lakes like Kathleen Lake. This makes species vulnerable to over-harvest unless the fishery is carefully managed. The impacts of winter fishing on the Kathleen Lake aquatic ecosystem are poorly understood. Winter creel surveys should be conducted to determine fishing pressure, fishing success and catch composition. Results should be employed in the management of these resources. The management plan contains a significant number of key actions to gain a better understanding of the aquatic species and communities in the park.

Cultural Reintegration
The park management plan contains numerous key actions aimed at reintegrating Southern Tutchone peoples with the regional ecosystem. Expected outcomes of these actions include and increased role of First Nations in management of Kluane NP&R; improved access to traditional territories and rights; increased level of cooperative management between Parks Canada and First Nations; and positive social, and economic benefits to local First Nations. The Ecological Integrity panel commented positively in their report, (Unimpaired for Future Generations"? Protecting Ecological Integrity with Canada's National Parks), regarding establishment of management partnerships between First Nations and Kluane NP&R.

Cultural Resources
Significant historical and archaeological resources are found within Kluane National Park and Reserve. Actions proposed in the management plan are not expected to result in direct negative impacts to these resources. The approach outlined will significantly increase levels of First Nation's participation in heritage and cultural resource management initiatives at the park. Enhanced working relationships between Parks Canada and local First Nations are anticipated. Kluane NP&R contains no Classified Federal Heritage Buildings. Additional evaluation of historical resources associated with gold mining, Alaska highway construction, and mountaineering is proposed.

Visitor Use
A Recreational Opportunities Working Group was established to identify new recreational opportunities, and discuss impacts of present and proposed uses. The group had a diverse make-up and included local residents and others with a keen interest in Kluane NP&R. Their deliberations helped shape management plan key actions. The plan aims to provide high quality visitor experiences while ensuring a high level of ecosystem protection. A significant number of visitor use management methods are in place in Kluane NP&R. Examples include the *Alsek River Management Guidelines*, and *Kluane National Park Aircraft Use Guidelines and Conditions*. These are evolving documents which are updated regularly to remain current. Feedback from guides, outfitters, visitors, resource conservation staff, and others has been incorporated into the guidelines.

The effects of road density upon the environment have been extensively studied in recent years by the US Forest Service and others. Study results generally indicate a strong positive correlation between road density and the level and number of disturbance factors impacting ecosystems. Road density within Kluane National Park and Reserve is very close to zero kilometres of road per square kilometre of protected area. There are short roads within the park but none of any scale that penetrate deep into it's interior. Approximately 250 km of rough access road was constructed during mineral exploration and development activities prior to establishment of Kluane NP&R. These roads have since been abandoned. Natural restoration has returned most to near a pre-disturbance state. Two old mining roads, the Alsek Road and the Mush Lake Road, are still in use. Maintenance activities on these routes is limited to repair of road bed in areas where stream erosion has occurred, and filling of large potholes. The Alsek Road is an unimproved single lane 4-wheel drive road that traverses about 18 km into Kluane NP&R. The Mush Lake road is a 22 km one lane mining road providing 4-wheel drive access to Mush and Bates Lakes, the Alder Creek Valley, and the Cottonwood Trail. Levels of use on the Alsek Road are not likely to increase significantly given continued maintenance of the road to 4x4 standards. Use levels are not restricted or monitored at the present. Park permits or registration is not required for day use activities taking place on the road. Current users of the Alsek Road include 4-wheel drive vehicles, mountain bikes, and hikers. The *Initial Environmental Evaluation for the Alsek Pass Project* made the following statement regarding the Alsek River access road:

> "Vehicle-wildlife collisions are probably not a problem along the existing access road toward the proposed DUA, due to the poor condition of the road and the necessity for very slow speeds.....".

> ".... some reduced habitat effectiveness, habituation and/or reduction in wildlife populations through road mortalities, hunting and poaching has probably already occurred."

Light fixed-wing and rotary aircraft are used in Kluane NP&R in support of back-country travel and park operations, as well as by several flight-seeing operators. Aircraft use has the potential to negatively effect wildlife, and visitor wilderness experience. Aircraft guidelines that restrict flight frequency, route, take-off and landing sites are in place to manage aircraft use within the park. Kluane NP&R has no direct means of controlling sight-seeing overflights in the protected area. Research indicates some ungulate populations may be vulnerable to harassment from aircraft use. Additional study and continued monitoring of aircraft use and its effects upon wildlife should be encouraged. Results should be used to refine aircraft management within the park.

Park Operations / EMS

Park administration and visitor reception functions have minimal direct impacts on Kluane NP&R. Administration, office, maintenance, staff housing and the main visitor reception facilities are located in the community of Haines Junction a few kilometers north of the park boundary. Haines Junction is located at the intersection of the Haines Road and the Alaska Highway. Kluane NP&R is presently developing and implementing an Environmental Management System (EMS) Action Plan that addresses key environmental aspects identified by Parks Canada. The intent is to minimise the environmental impacts of Parks Canada's operation and administration. Environmental aspects include Energy Conservation, Fleet Management, Green Procurement, Hazardous Material Management, Pesticides, Petroleum Storage Tanks, Solid Waste Management, Water Conservation, and Wastewater Management. Additional information including a complete list of key environmental aspects is available on the Parks Canada website at
http://www.parkscanada.gc.ca/natress/ENV_CON/ENV_STE/env_man_e.htm

Ecological Integrity

The approach taken in the management plan is precautionary and based on ensuring the long-term ecological integrity of Kluane National Park and Reserve. Standard conservation biology techniques such as adaptive management, and the precautionary principle have been employed in development of the Ecological Integrity Statement and individual proposed key actions within the plan. When detailed assessments are undertaken for activities and developments proposed in the management plan, impacts to natural and cultural resources, and visitor experiences will be considered.

Three evaluation criteria originally presented in the 1990 park management plan will be used to guide park management decision-making: compatible (sympathetic and complimentary with wilderness nature of park and resource sensitivities); controllable (timing and frequency of use) and reversible (monitor effects and adjust as required to minimise impacts or eliminate facility or use if needed). For instances where little empirical data is available or there is uncertainty about impact prediction accuracy, decision-making will be conservative allowing ecological integrity precedence over socio-economic, visitor use or other considerations. Utility of an adaptive management approach is predicated on appropriate long-term monitoring programs and program refinement. Securing adequate resources to undertake this approach is fundamental to its success.

The ECOLOGICAL INTEGRITY Panel report section entitled "Science as a Key Part of Park Management and Education" provides examples of where Parks Canada effectively utilized science in managing for ECOLOGICAL INTEGRITY. They cite the following example from Kluane NP&R:

> "in Kluane National Park Reserve, an interdisciplinary assessment of wilderness river use preferences, bear habitat, and bear risk potential, is being used to develop a revised pattern of rafting use for the Alsek River. This assessment has enabled the park to assure bear habitat and

movement while maintaining important elements of the wilderness rafting experience."

Policy Consistency

Key actions proposed in the *Kluane National Park and Reserve of Canada Management Plan* are consistent with the policies of Parks Canada and the federal government. The only possible exception is the proposed snowmobile trips for regional residents. The vast majority of Kluane National Park and Reserve is presently Zone 1 and Zone 2. Public use of snowmobiles in Zone 1 and 2 may be inconsistent with the zoning provisions of *National Parks Policy*. If these activities occur within wilderness areas established under the *National Parks Wilderness Area Declaration Regulations,* section 14 of the *Canada National Parks Act* may be contravened. Further policy review and public discussion of this issue may be required. Proposed snowmobiling activities are not expected to trigger the *CEAA* or successor environmental assessment legislation. Prior to undertaking these snowmobile events a non-CEAA environmental assessment should be prepared to document likely impacts as well as means to avoid or mitigate them. This would fulfill Parks Canada's policy obligation for exemplary use of environmental assessment. Assessment results should be employed when deciding on a course of action for these activities. The management plan proposes continued public use of snowmobiles at Kathleen Lake, a Zone 4 (Outdoor Recreation) area. This is consistent with Parks Canada Policy and zoning.

Wilderness

Section 14 (1) of the *Canada National Parks Act (CNPA)* enables the Governor in Council to declare any area of a park that exists in a natural state or that is capable of returning to a natural state to be a wilderness area. Large portions of Kluane National Park and Reserve are expected to be declared wilderness areas within a year of management plan approval. This will provide an enhanced level of protection to the majority of the protected area. Section 14 (2) of the *CNPA* states the Minister may not authorize any activity to be carried on in a wilderness area that is likely to impair the wilderness character of the area. The management plan proposes snowmobile events which will likely occur in designated wilderness areas once they are established. The potential for conflicts between motorized and non-motorized back-country travelers is limited by the low levels of back-country use in winter and the small number of snowmobile interpretive events. Snowmobile activities do however have the potential to impair wilderness character. Impacts routinely associated with snowmobile use include: emission of partially combusted hydrocarbons and other air pollutants; noise during engine operation; negative impacts to wildlife energy balance from human encounter stress or fleeing responses; and diminished ability for high quality wilderness experiences for visitors using non-motorized travel methods. Section 14(3) of the *CNPA* provides exceptions whereby the minister may allow activities in a wilderness area despite potential for wilderness character impairment. Exceptions include: park administration; public safety; provision of basic user facilities including trails and rudimentary campsites; or access by air to remote parts of the wilderness area. The snowmobile trips proposed in the management plan do not appear to fall into any of these categories.

Resources

Adequate fiscal and human resources are needed to successfully deliver the intended outcomes of management plan actions. The *Kluane National Park and Reserve of Canada Management Plan* should be used as a basis to rationalize additional funds to fulfill the mandated obligations of Parks Canada as outlined in policy and highlighted by the Ecological Integrity Panel. In the absence of additional funds, caution should be used when diverting funds from established programs of merit to fund new initiatives proposed in the management plan.

4.0 Cumulative Effects

The environmental impacts of individual projects appear to have limited potential to generate significant impacts. However the collective impacts of these projects may be significant. Considerable effort has

been expended by Kluane NP&R to determine the cumulative environmental effects of actions proposed in the park management plan. This work was initiated by Hegmann who conducted a cumulative effects analysis of the proposals in the 1990 *Kluane National Park Reserve Management Plan*, and the regional and park activities in place at the time of the study in 1995. Slocombe and others have recently completed an updated analysis using the same methodology on the revised 2001 *Kluane National Park and Reserve of Canada Management Plan*. Detailed results of these studies will not be presented here. Please consult these references for complete details of methods and results.

Park management has responded positively to recommendations in Hegmann's 1995 cumulative effects report for Kluane. *The Alsek River Management Guidelines* are an example. They have evolved in response to the cumulative effects report as well as input from commercial river guides, the Kluane warden service, and research and monitoring. Closure of the camping area near the small creek at the foot of Goatherd mountain is a specific example. This campsite was in a narrow travel corridor frequented by grizzlies. Consequently the potential for bear - human encounters was unacceptably high.

Alsek River rafting, and aircraft use in support of rafting and backcountry hiking were identified as the largest contributors to cumulative environmental effects in the protected area. Regional resource extraction (hunting, mining) and infrastructure development activities (road and community development) were also considered to be sources of negative cumulative effects on Kluane NP&R. The work of Hegmann, McCuthceon, McCann and others finds Grizzly bear to be the top species of concern. Mountain goat, Dall's sheep, and moose are also of note. The park management plan prescribes many key actions to eliminate or ameliorate these stressors. These results indicate satisfactory research and analysis has taken place regarding the expected cumulative effects of implementing the Kluane Plan. Where impact prediction accuracy or resource vulnerability demand, a cautious approach has been prescribed in the management plan.

Most filming in Kluane NP&R requires aircraft use. Aircraft are used to ferry crews and equipment to and from shoot locations and as a filming platform when recording aerial footage. When added to existing aircraft use (park operations, Icefields expedition support, rafting support, flight-seeing), the cumulative effects upon wildlife may be significant. Research conducted on Dall's sheep in and around Kluane NP&R indicates animals show a range of behavioral responses to fixed wing and rotary aircraft overflights. Few peer reviewed studies have been published that conclusively demonstrate direct cause and effect relationships between aircraft use and impacts to ungulate populations. Despite this, the body of evidence from the Grey literature and published literature appears to indicate repeated exposure to aircraft can significantly effect wildlife population viability. Parks Canada should adopt a cautious approach to approving additional use of aircraft within Kluane NP&R.

5.0 Determination

The *Kluane National Park and Reserve of Canada Management Plan* underwent strategic environmental assessment review in accordance with the *Environmental Assessment Process for Policy and Program Proposals* Cabinet directive. Screening was conducted early in the management planning process to ensure environmental effects of plan initiatives were considered before irrevocable decisions were made. This provided an opportunity to adjust the plan. The potential for management plan proposals generating adverse environmental effects was assessed.

Over the last 10 years Kluane National Park and Reserve of Canada has invested considerable time and resources to ensure adequate scientific and visitor use research in support of management planning and park management has taken place. Extensive research on bear - human conflicts in the back-country trail and river corridors of Kluane NP&R has been conducted. Management plan key actions presented in the

revised plan have been positively influenced by recommendations from these studies. Interventions such as human use quotas are in place in key areas such as green belt river corridors. Effectiveness of these approaches is monitored. Adaptive management feed back loops appear to be utilized to refine management methods. This is consistent with an ecosystem-based management approach working to achieve ecological integrity. The management plan provides a reasoned course of action to address current stressors affecting Kluane National Park and Reserve. Use of recreation management techniques and an adaptive management approach should limit the vulnerability of resources to significant change. Success of this approach is dependant upon carefully designed and executed monitoring work to measure effectiveness and support refinement of management tools. If adequate monitoring and follow-up activities are not undertaken, resources may be vulnerable to anthropogenically induced changes that may not be readily discernable until they are in an advanced state of development. This may limit options and success of corrective measures available once problems are detected.

Many proposals described in the management plan are conceptual in nature. It is not possible to fully evaluate the environmental effects of these initiatives at this time. As more detailed information becomes available, projects will be assessed pursuant to the provisions of the *Canadian Environmental Assessment Act (CEAA), Development Assessment Process / Yukon Environmental and Socio-economic Assessment Act (DAP / YESAA)* or other successor legislation. The Parks Canada Agency is a Responsible Authority under the *CEAA*. The Agency will not undertake any project prior to preparing an environmental assessment and deciding on a course of action to approve, not approve, or refer the project for additional EA review.

A substantial number of the key actions are refinements of existing management approaches in use at Kluane NP&R. Few new activities or facilities are proposed. Development and operation of a day use area at Alsek Pass was proposed in the *1990 Kluane National Park Reserve Management Plan*. A detailed Initial Environmental Evaluation completed in 1996 concluded the project was likely to generate significant impacts some of which would be difficult or impossible to effectively mitigate. The project has since been abandoned and is not proposed in the present management plan.

Some actions are expected to generate positive employment and economic benefits for local and regional businesses. Others are likely to negatively effect these sectors. Consistent with Land Claim provisions, significant positive socio-economic benefits are expected to accrue to local First Nations. Exercising claim provisions such as “right of first refusal” may generate resentment amongst some members of local communities. Clear and accurate communication of claim rights, business and tendering processes, to all affected parties is needed in order to minimise misinformation and maximise community harmony.

Key stressors affecting Kluane National Park and Reserve have been identified. The *Kluane National Park and Reserve of Canada Management Plan* proposes numerous actions to address these threats. An Ecological Integrity Statement (EIS) has been incorporated into the management plan. The EIS describes indicators, targets, and monitoring protocols that will be used to determine the state of ecological integrity in the park. Results will be reported on a regular basis in *State of Protected Heritage Areas Reports* and in annual reports detailing progress implementing the management plan. Many of the key actions in the plan address stressors from activities outside the park boundary. A greater ecosystem or regional land management approach is promoted in the plan. Enhanced levels of understanding, collaboration, and cooperation between neighboring agencies and individuals involved in land management activities are anticipated. This should positively influence levels of ecological integrity in Kluane National Park and Reserve. Satisfactory research and analysis has taken place regarding the expected cumulative effects of implementing the management plan. Recommendations from cumulative

effects assessment studies have been incorporated into the management approach outlined in the plan and in daily operations of Parks Canada activities. Implementation of the *Kluane National Park and Reserve of Canada Management Plan* is not expected to cause significant negative environmental effects. The net cumulative effect of the plan will be an enhanced ability to restore and manage toward higher levels of ecological integrity. Adequate public review has taken place during the management planning process.

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APPENDIX 1: Tables

Table 1: Key Action Summary

Table 2: Potential Effect of Key Actions

Table 1: Key Action Summary

Management Plan Section	# Key Actions
4.0 A Place for Nature	**33 Total**
4.1 Overview	0
4.2 Ecosystem Model	0
4.3 Environmental Stressors	0
4.4 Ecological Integrity Protection Principles	0
4.5 Shared Regional Ecosystems	10
4.6 Cultural Reintegration	4
4.7 Ecological Monitoring	5
4.8 Vegetation	3
4.9 Wildlife	5
4.10 Aquatic Ecosystems	5
4.11 Indicators of Ecological Integrity	0
4.12 Communicating the Need for Ecological Integrity	1
5.0 A Place with a Cultural Heritage	**9 Total**
5.1 Overview	0
5.2 Cultural Heritage Resources	9
6.0 A Place for People	**76 Total**
6.1 Overview	0
6.2 First Nations Traditional Uses	4
6.3 Current and Future First Nations Opportunities	8
6.4 Heritage Tourism	5
6.5 Interpretation and Outreach	12
6.6 Visitor Services and Facilities	15
6.7 Effective Recreational Use Management	3
6.8 Defining the Recreational Visitor Experience - Area Concepts	
6.8.1 Mush and Bates Lakes, Alder Creek Valley and Cottonwood Trail	4
6.8.2 Kathleen Lake	1
6.8.3 Dezadeash - Alsek Valleys	3
6.8.4 Slims River Valley	2
6.8.5 Duke and Donjek River Valleys	2
6.8.6 The Icefields	3
6.8.7 Highway Corridor	1
6.8.8 Winter Experience	6
6.8.9 Trails and Routes	0
6.8.10 Access Air	2
6.8.11 Visitor Use and Impact Monitoring	1
6.10 Public Safety and Law Enforcement	4
7.0 Partnerships and Public Involvement	**8 Total**
7.1 International and National Cooperation	6
7.2 Public Involvement	2
8.0 Administration and Operations	**8 Total**
8.1 Environmental Stewardship	4
8.2 Operations	4

Management Plan Section	# Key Actions
Grand Total	**134**

Table 2: Potential Effect of Key Actions

Impacts on the environment can lead to changes in existing conditions. The impacts can be direct, indirect or cumulative. Direct impacts refer to changes in environmental components resulting from direct cause-effect interactions between the environment and project activities. Indirect impacts result from cause-effect consequences of interactions between the environment and direct impacts. Cumulative impacts refer to the accumulation of changes to the environment caused by human activities. Effects can act at different ecological (species, community to ecosystem) and social (individual to community) levels, vary over space and time, and can be positive or negative.

4.5 Shared Regional Ecosystems

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
Work with governments, agencies and councils with jurisdiction adjacent to the park, to prepare an interagency bear management plan.	⇔ No direct impacts anticipated. ⇧ Implementation of an interagency bear management plan has potential to positively impact local and regional bear populations and their long-term viability.	⇔ No direct impacts anticipated. ⇧ Maintenance of viable bear population is positive economic benefit to First Nations, Guides and Tour Operators (wildlife viewing; hunting). ⇧ Maintenance of viable bear population is positive social benefit to First Nations groups (traditional activity), conservationists, and wildlife watchers. ⇩ Regional bear plan implementation may result in activity restrictions or other mitigations that are costly to businesses.
	No mitigation needed. Interagency bear management plan should include provision for data gathering (e.g. harvest effort, harvest numbers, human-bear conflicts, etc.) and sharing. This will assist determination of sustainable harvest levels and making sound bear management decisions.	Involve business and resource sector representatives in development and implementation of the interagency bear management plan.

4.5 Shared Regional Ecosystems

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Continue to work with the Alsek Renewable Resources Council and adjacent governments and agencies to implement the Alsek Moose Management Plan.	⇔	No direct impacts anticipated.	⇔	No direct impacts anticipated.
	⇧	Plan implementation has potential to positively impact local and regional moose populations and their long-term viability.	⇧	Maintenance of viable moose population is positive economic benefit to First Nations, Guides and Tour Operators (wildlife viewing; hunting).
			⇧	Maintenance of viable moose population is positive social benefit to First Nations groups (traditional activity), conservationists, and wildlife watchers.
		Parks Canada should continue to actively participate in Alsek Moose Management Plan implementation and updating.		No mitigation needed.
Update the 1995 cumulative effects assessment concerning the impacts of visitor activities, harvesting practices, park operations, natural ecological processes and the aboriginal cultural relationship to place, within the greater Kluane ecosystem.	⇔	No direct impacts anticipated.	⇔	No direct impacts anticipated.
	⇧	Updated cumulative effects assessment will provide solid basis from which to assess impacts of proposed projects and activities upon valued ecosystem components (VEC's). Implementation of Cumulative Effects Assessment recommendations likely to increase ecological integrity (EI) of Greater Kluane Ecosystem.	⇧	Increased understanding and recognition of the role of First Nations in the greater Kluane ecosystem is likely to result.
			⇩	Cumulative effects assessment has yielded greater understanding of cumulative impacts of human activities on VEC's. New business proposals formerly considered acceptable by Parks Canada may now be considered inappropriate.
		No mitigation needed.		No mitigation needed.
In collaboration with others, maintain and enhance geographic information systems and other tools to support decision-making at the regional level.	⇔	No direct impacts anticipated.	⇔	No direct impacts anticipated.
	⇧	Enhanced use of GIS and other tools will assist making sound decisions using all available data. Positive benefit to ecosystems should accrue.		
		Parks Canada should continue to participate in multi-agency committees and develop new ones if necessary. *Management Bulletin 2.4.9, Ecological Data Management*, provides national guidelines for management and use of ecological data by Parks Canada.		No mitigation needed.

4.5 Shared Regional Ecosystems

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Parks Canada will encourage and support the development and implementation of a multilateral agreement to provide for the management of Species at Risk.	⇔	No direct impacts anticipated.	⇔	No direct impacts anticipated.
	⇧	Ecosystem approach to management of local and regional species at risk should reduce vulnerability of species to further loss or prevent additional species becoming at risk. Biodiversity will be maintained.		
		Many species travel widely and ignore geopolitical boundaries. Regional multi-agency management approaches increase chance of successful management of species at risk.		No mitigation needed.
Parks Canada will encourage and support the development and implementation of a multilateral agreement to support a Yukon Conservation Data Centre.	⇔	No direct impacts anticipated.	⇔	No direct impacts anticipated.
	⇧	Better data for decision-making should benefit greater Kluane species and ecosystems.		
		Data sharing is essential to an ecosystem based management approach. Parks Canada should make its data available to others. A Data Usage Agreement and additional guidance for Parks Canada is found in *Management Bulletin 2.4.9, Ecological Data Management*.		
In collaboration with others, identify and map priority ecologically significant areas and activities in the greater Kluane ecosystem.	⇔	No direct impacts anticipated.	⇔	No direct impacts anticipated.
	⇧	Better data for decision-making should benefit greater Kluane species and ecosystems.		
	⇩	If mapping activities involve field work environmental impacts may result. Factors that influence magnitude and significance of impacts include: access mode(s); number of participants; and need for overnight camps.		

4.5 Shared Regional Ecosystems

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
		Impacts of mapping and field work are known, predictable and mitigable with known technology. Mapping activities will likely not trigger the CEAA or successor environmental assessment legislation. Preparation of a non-CEAA EA would document likely impacts of this activity, means to avoid or lessen impacts, and would fulfill Parks Canada's policy obligation for exemplary use of EA.		No mitigation needed.
Work with adjacent governments and agencies to develop and implement common aquatic ecosystem goals and strategies.	⇔	No direct impacts anticipated.	⇔	No direct impacts anticipated.
	⇧	Ecosystem level planning is likely to increase EI of aquatic ecosystems.	⇧	Improved public knowledge, understanding and support for regional aquatic ecosystem management goals and strategies.
		May be difficult to obtain consensus on common goals as agency mandates vary. Ecosystem level aquatic planning and management is needed.		No mitigation needed.
Work with adjacent governments and agencies to identify regional wildlife populations under stress or at risk e.g. Burwash caribou herd and, if feasible and appropriate, develop management strategies to restore these populations.	⇧	Implementation of management strategies has potential to positively impact local and regional populations at risk and increase the probability of their long-term viability. Natural levels of biodiversity will be maintained	⇧	Maintenance of viable moose populations is positive economic benefit to First Nations, Guides and Tour Operators (wildlife viewing).
			⇧	Maintenance of viable populations of caribou and other species at risk is a positive social benefit to First Nations groups, conservationists, and wildlife watchers.
		No mitigation needed.		No mitigation needed.
Work with managers from the other protected areas in the World Heritage Site to cooperate on mutually beneficial monitoring programs.	⇔	No direct impact anticipated.	⇧	Enhanced interagency working relationships are likely to result. Opportunities for increased resource efficiency, joint training and operations, and staff deployments are possible.
	⇧	Monitoring program results will enable more informed decision making. Positive benefit to ecosystems should accrue.		

4.5 Shared Regional Ecosystems

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
	No mitigation needed. Adequate monitoring program design and data documentation is needed to ensure maximum benefit from monitoring effort. Parks Canada *Management Bulletin 2.4.9, Ecological Data Management*, provides subject guidance.	No mitigation needed.

4.6 Cultural Reintegration

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
Work with Champagne and Aishihik First Nations and Kluane First Nation to establish programs which enable First Nations members to become re-acquainted with their cultural heritage in the park e.g. culture camps, participation in wildlife surveys, and to convey this knowledge to members of their communities.	Difficult to predict specific impacts of cultural camps as concept is vague in the management plan. Plan makes no mention of need for permanent camp infrastructure. It is reasonable to expect new facilities such as trails and cabins may be built. Motorized means of access including snowmobile and ATV's may be used when undertaking traditional renewable resource harvesting and other cultural heritage activities.	⇧ improved connection of First Nations peoples to traditional territories and activities. Increased community pride. ⇧ Improved understanding of First Nations cultural heritage by First Nations and other peoples. ⇧ First Nations cultural history and continuity is maintained. Some visitors may feel trapping activities are compatible with the mandate of Kluane NP&R. Knowing these activities occur or witnessing them may enhance their visitor experience. ⇩ Some visitors may feel trapping or other traditional cultural activities are inappropriate in a protected area. Knowing these activities occur or witnessing them may detract from their visitor experience.
		Provide park visitors pre-trip and on-site interpretation materials explaining educational traplines and other First Nations activities they may encounter in the park backcountry. Information on historic First Nations activities in the area, levels of harvest, expected impacts to populations and species, and management tools (i.e. monitoring) in use should be included. Amount of trapping will be minimal and occur during times of low visitor use. Probability of user conflict is therefor low.
Work with Champagne and Aishihik First Nations and Kluane First Nation to develop and deliver programs e.g. workshops, spending time on the land with elders, which assist park staff and others to understand how First Nations' traditional knowledge and ties to the land contribute to the maintenance of ecological integrity.	Dependant upon access modes, number of participants, trip duration and route.	⇧ improved connection of First Nations peoples to traditional territories and activities. Elevated levels of First Nations community pride and continuity. ⇧ Improved understanding of First Nations cultural heritage by park staff and others.
	Impacts of travel are known, predictable and mitigable with known technology.	No mitigation needed.

4.6 Cultural Reintegration

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Establish guidelines, which will ensure that park research and management programs are used as opportunities to familiarize local First Nations members with the park's plant and animal communities.	⇧	Renewed interest in traditional ecological knowledge (TEK). Use of TEK and scientific knowledge together will enhance ecosystem management in Kluane.	⇧	First Nations cultural history and continuity is maintained.
		Impacts of individual research and management programs will be assessed at a strategic impact assessment (EAPPPP) and/or project (CEAA) impact assessment level as they are developed.		No mitigation needed.
Support local First Nations in the development and delivery of educational programs to First Nation members that focus on land-based aspects of Southern Tutchone culture e. g. educational trapline.	⇩	Direct mortality of trapped species.	⇧ ⇩	First Nations cultural history and continuity is maintained. Some visitors may feel trapping activities are compatible with the mandate of Kluane NP&R. Knowing these activities occur or witnessing them may enhance their visitor experience. Some visitors may feel trapping is inappropriate in a protected area. Knowing these activities occur or witnessing them may detract from their visitor experience.
		A program to monitor harvest levels and population status should be developed. Harvest rates should be reduced or curtailed if monitoring results indicate significant impacts to species or populations is occurring. Harvest rates are expected to be very low. Significant impacts to population size or structure are not anticipated. Commercial trapping activities will not be permitted within Kluane NP&R.		Provide park visitors pre-trip and on-site interpretation materials explaining educational traplines and other First Nations activities they may encounter in the park backcountry. Information on historic First Nations activities in the area, levels of harvest, expected impacts to populations and species, and management tools (i.e. monitoring) in use should be included. Amount of trapping will be minimal and occur during times of low visitor use. Probability of user conflict is therefor low.

4.7 Ecological Monitoring

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Develop and implement an ecological monitoring program in cooperation with researchers associated with the Arctic Institute of North America at Kluane Lake, Champagne and Aishihik First Nations, Kluane First Nation.	⇧	Enhanced ability to detect source and magnitude of ecosystem change and where necessary react in a timely manner.	⇧	Research gaps and needs will become apparent during development and implementation of the ecological monitoring program. Improved understanding of needs will assist researchers to develop proposals of interest to Kluane NP&R. Enhanced relationships between Kluane NP&R, researchers and First Nations are likely to result.
	⇩	monitoring activities have potential to be disruptive to species and communities, especially if significant aircraft use is involved.	⇩	Monitoring activities in remote areas of Kluane NP&R may reduce quality of wilderness experience.
		monitoring program must be carefully designed to minimize impacts to resources being monitored and others co-habiting these sites. Environmental impacts of proposed monitoring programs should be assessed prior to their implementation.		Visitors should be provided with pre-trip and up to date information upon arrival describing current or proposed monitoring activities in Kluane NP&R.
As part of the long-term Kluane Ecological Monitoring Program (KEMP), implement protocols that monitor, among other things: the climate at each of the permanent monitoring transects, primary productivity of plants on a landscape scale, spruce cone production, density of berry crops important to bears and other wildlife, relative density of the snowshoe hare population and relative density of furbearer populations.	⇧	Long-term survey data is a valuable input to informed decision-making. Positive impacts to species and ecosystems may result.	⇩	Monitoring activities in remote areas of Kluane NP&R may reduce quality of wilderness experience.
	⇩	monitoring activities have potential to be disruptive to species and communities, especially if significant aircraft use is involved.		
		monitoring program must be carefully designed to minimize impacts to resources being monitored and others co-habiting these sites. Impacts of proposed monitoring should be assessed prior to implementation.		Visitors should be provided with pre-trip and up to date information upon arrival describing current or proposed monitoring activities in Kluane NP&R.
As part of KEMP, carry out in a long-term, consistent manner, surveys that monitor park and regional wildlife populations such as Dall's sheep, moose, Kokanee salmon; and analyze this information and take appropriate management actions.	⇧	Long-term survey data is a valuable input to informed decision-making. Positive impacts to species and ecosystems may result.	⇧	Aircraft charter for aerial survey work is a positive economic benefit to local or regional companies.
	⇩	monitoring activities have potential to be disruptive to species and communities, especially if aircraft use is involved.	⇩	Monitoring activities such as aerial surveys can be intrusive and may decrease the quality of visitor experience, especially in wilderness areas of Kluane NP&R.

4.7 Ecological Monitoring

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
		Monitoring program must be carefully designed to minimize impacts to resources being monitored and others co-habiting these sites. Recommendations of research regarding aircraft overflight impacts to Dall sheep and other species should be factored into the design of the monitoring program. Environmental impacts of proposed monitoring programs should be assessed prior to their implementation.		If monitoring activities such as aerial surveys are planned, inform the public prior to undertaking them. Possible means of communicating information include local media, Parks Canada website, Parks Canada or community bulletin boards, and visitor centres. Monitoring results should be shared in a timely manner to increase public understanding and support for these activities.
Participate in regional, national and international monitoring networks such as the Breeding Bird Survey of North America and relevant monitoring programs of agencies like Atmospheric and Environmental Services Canada, and the Wildlife Branch of Yukon Renewable Resources.	⇧ ⇩	Additional monitoring data will assist ecosystem based management of Kluane NP&R. Monitoring activities have potential to impact species, communities, or ecosystems.	⇩	Monitoring activities in remote areas of Kluane NP&R may reduce quality of wilderness experience.
		Impacts of monitoring activities should be assessed and appropriate mitigating measures prescribed prior to implementation.		Visitors should be provided with pre-trip and up to date information upon arrival describing current or proposed monitoring activities in Kluane NP&R.
Monitor on long-term permanent plots, changes in the forest's structure and function as a result of recent large-scale spruce beetle outbreaks.	⇔	No significant impacts are anticipated. Impacts dependant upon monitoring methods employed but expected to be insignificant.	⇧	Improved understanding of forest structure and function may assist commercial timber interests minimize spruce beetle impacts to their operations.
		Monitoring results should be shared with researchers, conservation data centres, neighbours and the forestry sector.		No mitigation needed.

4.8 Vegetation

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Develop a vegetation management plan for the park, including an examination of normal succession for the Kluane ecosystem, fire history and the potential role of prescribed fires in these plant dynamics.	⇔	Vegetation plan development will produce no direct impacts.		
	⇩	Use of prescribed fire may result in immediate direct mortality of vegetation and fauna, and habitat change over the midterm.	⇩	area closures and smoke during fire events may negatively effect human health and visitor experience over the short-term.
	⇧	Prescribed fire use may lead to a more natural forest composition over the long term. Ecological integrity of Kluane NP&R may increase as a result.	⇧	A more diverse natural vegetation mosaic may increase visitor experience quality.
			⇧	Potential increased ability to protect communities, real estate and resource values in areas adjacent to Kluane NP&R.
		Conduct a strategic environmental assessment of the vegetation management plan pursuant to the EAPPPP. Use of prescribed fire needs to be fully rationalized and carefully planned. Environmental effects of proposed prescribed fires will be assessed pursuant to section 1.1(a) of the CEAA Inclusion List Regulations and documented in a screening report.		A pro-active communications program is necessary prior to use of prescribed fires. Increased public knowledge and understanding of long term effects of fire suppression, the role of prescribed fires in vegetation restoration, and impacts of smoke exposure on human health is likely to bolster support for prescribed fire use in Kluane NP&R.
Determine the record of historical outbreaks of spruce bark beetles in the park in order to better understand the significance of the large-scale beetle outbreaks of the 1990s in the forests of the Kluane region.	⇔	No impacts anticipated.	⇧	Improved understanding of role spruce bark beetles play in regional forest structure and function.
	⇧	Increased knowledge of forest ecosystem dynamics will aid informed decision-making.	⇩	Increased information regarding outbreaks within Kluane NP&R may reinforce forest sector and public perceptions of the park as a source of infestation that negatively impacts the regional forest economy.
		Spruce bark beetle research results should be factored into the park vegetation management plan. Results should be shared with researchers, conservation data centres, neighbours and the forestry sector.		Parks Canada needs to communicate results in a manner that clearly explains the ecology of the forest and key causative factors believed to be operating (e.g. climate change).

4.8 Vegetation

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Work to prevent the introduction of non-native plant species, and where they exist and warrant action, control or eliminate them through effective management programs.	⇧	Control or elimination of exotic plant species will increase ecological integrity of Kluane NP&R. Levels of non-native plant species are presently low. Alfalfa is established along highway corridors and some Day Use Areas. Inventory of exotics was completed in 1999.	⇧	Effective management of exotic plants in Kluane NP&R should prevent spread to adjacent land holders. Economic and functional value of land holdings should be maintained.
		Impacts of proposed management programs will be assessed pursuant to section 1.1(d) of the CEAA Inclusion List Regulations and summarised in a screening report. Management programs often involve herbicide application. An Integrated Pest Management Plan must be prepared or updated annually as specified in *Management Directive 2.4.1: Integrated Pest Management*. The *Parks Canada Integrated Pest Management Manual* provides additional direction. Monitoring should be conducted to determine success of control actions. The Environment Canada Publication: *Guide to Monitoring Exotic and Invasive Plants* is one suggested approach.		

4.9 Wildlife

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Identify and map critical habitat and movement corridors for large mammals and introduce management measures as required to protect them e.g. Alsek River Management Guidelines.	⇧	Protection of habitat and corridors will increase habitat suitability for large mammals (increased habitat connectivity, lower encounter rate with humans). Long-term viability of large mammal species in Kluane NP&R is likely to increase.	⇩	Area closures, seasonal closures, human use quotas, campsite or route designation, trip departure scheduling or other management techniques may limit the number of clients available to guides operating in Kluane NP&R backcountry. Reduced economic opportunity and company viability may result.
	⇧	Decreased human-wildlife encounters are likely to result. This may lead to a decreased need for wildlife management actions (aversive conditioning, immobilization, relocation, destruction). Capture stress and handling mortality will decrease.	⇧	Viable mammal populations and human use management techniques is likely to ensure continued high quality visitor experiences within Kluane NP&R.
			⇧	Reduced number of wildlife management actions will save Parks Canada money and avoid exposing staff to risky procedures such as drug handling and destruction of problem wildlife.
		No mitigation needed. Monitoring should be conducted to see if critical habitats and corridors identified are being protected and used by large mammals as forecast. Monitoring results can be used to refine protective measures to ensure they fulfil intended purpose.		Involve guides and the public in development or review of new management measures.
Review and implement appropriate recommendations from the Grizzly Bear Project report.	⇧	Increased probability for long-term viability of Grizzly bear population in Kluane NP&R and greater Kluane ecosystem. Maintenance of a viable population in greater Kluane ecosystem is an indicator of a healthy ecosystem.	⇧	The grizzly bear is a symbol of wilderness to many people.
			⇩	Property loss or damage, human injury or mortality, livestock depredation, and other impacts are possible as long as grizzly bears are present.
		No mitigation needed. Many recommendations in the report are prescribed to avoid or mitigate impacts to bear populations.		Adequate human use management provisions are in place that minimize the risk of personal injury or property loss occurring (e.g. backcountry human use quotas; route and campsite designation; You are in Bear Country brochure, mandatory use of bear-proof food canisters in the backcountry).

4.9 Wildlife

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Continue to support the collection of information on bear ecology through cooperative scientific research and local and traditional knowledge for management purposes.		Number and severity of impacts depends upon the type of research and traditional knowledge activities conducted.	⇧	Acknowledgment of importance of traditional knowledge. Application of traditional knowledge for management purposes validates its worth.
	⇩	Capture myopathy and occasionally mortality may occur when bear immobilization and handling is required.		
	⇧	Research may yield increased knowledge and understanding of bear ecology. This information can be used to refine management methods. Reduced numbers of bear-human conflicts and active management actions may result. Probability of secure long-term bear populations in Kluane NP&R will increase.		
		Researchers and Parks Canada staff are trained in wildlife handling techniques and employ best handling practices. Additional training is delivered prior to employing new immobilization drugs or methods. Scientific research and traditional knowledge should be incorporated into the bear management plan as needed. Impacts of research and traditional knowledge activities to be assessed pursuant to EAPPPP and/or CEAA prior to undertaking these activities.		No mitigation needed.
Continue to implement the park's Bear Management Plan	⇔	Status Quo. Bear management plan provides a reasoned course of action to protect bear populations, and human health, safety and property. Effective management programs reduce the probability of bear-human conflicts throughout Kluane NP&R. Expectation is for limited need to undertake active management actions involving capture, relocation or destruction of bears.	⇔	Status Quo. Effective management programs reduce the probability of bear-human conflicts throughout Kluane NP&R. No significant changes to loss of personal property, length and duration of trail / area closures is anticipated.

4.9 Wildlife

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
		Effectiveness of bear management programs and actions should continue to be monitored and assessed. Results can be used to refine management methods as needed.		Inform visitors regarding appropriate behaviour and other human use management tools in place to reduce potential for bear-human conflicts.
Analyze existing data from wildlife surveys and set a target and confidence levels for these wildlife populations, within the first year of plan implementation	⇔ ⇧	No direct impacts anticipated. Accurate population data and continued monitoring are essential to making informed wildlife management decisions. Ability to identify significant trends and respond with appropriate management will be enhanced. Increased probability of wildlife population long-term viability is expected.	⇔	No direct impacts anticipated.
		No mitigation needed.		No mitigation needed.

4.10 Aquatic Ecosystems

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Establish a regional aquatics working group to develop and implement aquatic ecosystem management objectives and strategies, which provide for the maintenance of ecological integrity of aquatic ecosystems in the park.	⇧	Application of ecosystem management approach increases the probability of maintaining or enhancing levels of aquatic ecosystem integrity.	⇧	Enhanced working relationship for Kluane NP&R in the region. May lead to increased knowledge , understanding and support for the park in the region.
			⇧	Local area residents and other park visitors will be able to experience healthy aquatic ecosystems.
		Ecosystem approach is needed given consumptive use of fisheries resource (recreational sport fishery; past spawn taking operations by Yukon Territorial Government). Fishery is regulated by the National Parks Fishing Regulations. Methods of fishing, daily catch, possession and overall length limits, and other restrictions or prohibitions are specified. Fish productivity is low in oligotrophic, northern, subarctic lakes like Kathleen Lake. This makes species vulnerable to over-harvest unless the fishery is carefully managed.		No mitigation needed.
Continue to monitor water quality on the Dezadeash River to ensure that it meets or exceeds federal water quality guidelines.	⇔	Status Quo. Downstream water quality will continue to meet or exceed federal water quality guidelines.	⇧	Potential downstream uses of water will not be compromised.
		Develop a contingency plan for circumstances where water quality fails federal guidelines on a regular basis.		No mitigation needed.
Monitor baseline water quality and key aquatic populations in order to detect changes in the park's aquatic ecosystems.	⇧	Water quality monitoring impacts are likely negligible. Results may allow early detection of change and assist management of the resource.	⇔	No direct impacts anticipated.
	⇩	Fisheries monitoring techniques often involve direct mortality of species (test-nets; beach seines). Excessive mortality may impact species populations and aquatic community structure. Sampling techniques (gill netting) that provide the best quantitative measures of pelagic fish populations are highly destructive.		

4.10 Aquatic Ecosystems

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
		Impacts of monitoring need to be assessed (pursuant to EAPPPP and/or CEAA/DAP) and mitigative measures prescribed prior to undertaking these activities. Costs and benefits of various monitoring methods should be factored into design of monitoring program. Low impact methods such as sonar, aerial counts, counting fences and others are possible options.		No mitigation needed.
Update and evaluate inventories of native fish populations within park aquatic ecosystems.	⇩	Fisheries inventory techniques often result in direct mortality of species (test-nets; beach seines). Excessive mortality may impact species populations and aquatic community structure and function.	⇧	Improved public knowledge of native fish populations in Kluane NP&R.
	⇧	Accurate population data will be available for assessing health of populations and deciding on appropriate management techniques.		
		Impacts of fish inventory activities need to be assessed (pursuant to EAPPPP and/or CEAA/DAP) and mitigative measures prescribed prior to undertaking these activities. Costs and benefits of various methods should be factored into design of inventory program.		No mitigation needed.
Collect information on the presence of amphibians and their potential role as indicator species for the ecological integrity of wetlands.		Impacts depend upon methods used to measure amphibian presence. Most methods are low impact and rely on: call count surveys; aquatic egg mass and tadpole surveys; and baseline inventories in which participants are assigned specific areas to search and record all amphibians found.	⇧	Amphibian monitoring programs often make extensive and effective use of volunteers. Local and regional understanding of Kluane NP&R populations as well as enhanced working relationships with locals and stakeholders may result.
	⇧	Increased understanding of amphibian populations in Kluane NP&R.		
	⇧	Potential use of amphibians as indicators of wetland EI and sentinels of climate change impacts.		

4.10 Aquatic Ecosystems

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
	Standard monitoring protocols have been developed by the North American Amphibian Monitoring Program (NAAMP) and other organizations. Parks Canada should employ these or complementary methods if possible so data will conform to data management standards and be comparable across jurisdictional boundaries. Amphibian monitoring impacts are known, predictable and mitigable with known technology.	Use of volunteers needs to be assessed on a project by project basis. Volunteers will not be used to replace Kluane NP&R staff but to augment project resources where needed and where there is manageable risk to staff and volunteers. Guidelines in the Parks Canada Volunteer Program should be used. Additional guidance is provided by *Management Directive 2.7.1 Volunteer Program (1990)*. Volunteer Program forms are available at http://167.33.224.188/human_resources/hrforms.htm

4.12 Communicating the Need for Ecological Integrity

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Provide opportunities for the public to learn more about park research and management actions and the role they play in maintaining ecological integrity, by ensuring a communication component is included in all park research and major management actions.	⇔	No direct impacts anticipated.	⇧	Increased public knowledge and understanding of park initiatives is likely to result in greater public support for Kluane NP&R.
			⇧	Public interest in volunteer work on research projects is likely to increase. Volunteer participation is likely to lead to enhanced levels of understanding and support for the park (+ve feed back loop).
		No mitigation needed.		Use of volunteers needs to be assessed on a project by project basis. Volunteers will not be used to replace Kluane NP&R staff but to augment project resources where needed and where there is manageable risk to staff and volunteers. Guidelines in the Parks Canada Volunteer Program should be used. Additional guidance is provided by *Management Directive 2.7.1 Volunteer Program (1990)*. Volunteer Program forms are available at http://167.33.224.188/human_resources/hrforms.htm

5.2 Cultural Heritage Resources

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Support programs which further the understanding of traditional Southern Tutchone relationships with the park, including community-based research projects that will identify, inventory and research cultural sites, trails, etc. and evaluate the future use of these features. A priority project will be to identify and inventory and map traditional First Nation trails in the park.	⇧	Integrity of cultural resources will be maintained.	⇧	Opportunity for First Nations to re-connect with the land and their cultural heritage.
	⇩	Some cultural resource management techniques involve excavation, surface disturbance, vegetation removal and other activities which negatively impact the natural environment. Exposed soils are vulnerable to erosion and may lead to decreased surface and groundwater quality.	⇧	Cultural resource management skills learned in the park can be applied throughout First Nations traditional territories.
			⇧	Increased knowledge and understanding of First Nations traditional activities and heritage in the park.
		Impacts of various cultural resource management techniques are predictable and can be mitigated with known technology. Parks Canada cultural resource management principles and practices will be employed.		No mitigation needed.
Develop a cultural resource management program for the park that involves the local First Nations governments and contributes to their cultural resource management capacity.	⇧	Integrity of cultural resources will be maintained.	⇧	Opportunity for First Nations to re-connect with the land and their cultural heritage.
			⇧	Cultural resource management skills learned in the park can be applied throughout First Nations traditional territories.
		Employ Parks Canada cultural resource management principles and practices.		No mitigation needed.
Evaluate the significance of known cultural resources associated with gold mining, highway construction and mountaineering.	⇔	No direct impacts anticipated.	⇧	Increased knowledge and understanding of historic cultural resources and Kluane NP&R history. Greater support for the park may result.
		No mitigation needed.		Employ standard cultural resource management methods to minimize impacts to resources.
Complete the research and produce an administrative history on the park.	⇔	No direct impacts anticipated.	⇧	Increased knowledge and understanding of Kluane NP&R history. Greater support for the park may result.
		No mitigation needed.		No mitigation needed.

5.2 Cultural Heritage Resources

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Establish protocols which will ensure that cultural resource management programs are used as vehicles for First Nations' cultural and heritage education.	⇔	No direct impacts anticipated.	⇧ ⇧	Opportunities for First Nations to re-connect with the land and their cultural heritage. Cultural resource management skills learned in the park can be applied throughout First Nations traditional territories.
		No mitigation needed.		No mitigation needed.
Research and use aboriginal place names on park signage, publications, etc., and explain the history and importance of the place names, which will inform visitors that the park is within Champagne and Aishihik First Nations and Kluane First Nation traditional territories.	⇔	No direct impacts anticipated.	⇧	Increased knowledge and understanding of First Nations past and present role in greater Kluane ecosystem.
		No mitigation needed.		No mitigation needed.
Develop a joint identity for the park (including signs, publications, etc.) with local First Nations to reflect the cooperative management of the park.	⇔	No direct impacts anticipated.	⇧ ⇧	Increased knowledge and understanding of First Nations past and present role in greater Kluane ecosystem. Increased pride in First Nations communities.
		No mitigation needed.		No mitigation needed.
Support local First Nations in the development and delivery of educational programs to First Nations members, on aboriginal culture related to the park.	⇔	No direct impacts anticipated.	⇧	Increased understanding amongst First Nations of their historical connections to the park. Greater youth interest in cultural heritage may occur. Community pride and prospects of continued cultural continuity will be enhanced.
		No mitigation needed.		No mitigation needed.
Jointly, Parks Canada and local First Nations will educate park staff and FN members about different perspectives concerning cultural resources and their management.	⇔	No direct impacts anticipated.	⇧	Increased levels of cross-cultural awareness and understanding of diverse world views. Greater mutual respect amongst First Nations and park staff should occur.
		No mitigation needed.		No mitigation needed.

6.2 First Nations Traditional Uses

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
Conduct fur-bearer research in the park, using First Nations, Parks Canada and scientific personnel, to enable informed decisions on trapping.	Difficult to predict impacts as concept is vaguely defined in the management plan. Type and severity of impacts is dependant upon research techniques employed. Track and scat counts as well as trapping are routinely used to assess furbearer population status. ⇧ Research results can be employed in management of trapping activities to ensure long-term viability of harvested species.	⇧ Enhanced cooperative working relationship between Parks Canada staff and First Nations. ⇧ Increased knowledge and understanding of traditional ecological knowledge amongst Parks Canada staff. ⇧ Increased knowledge and understanding of scientific knowledge amongst First Nations persons.
	Part of the Canadian Rural Partnership, Pilot Projects Initiative year 2000-2001. The First Nations Furbearer Monitoring Project employs local First Nations trappers and youth to gather data to monitor the population density of fur-bearing mammals in part of Kluane National Park. Funding Approved: $7,500.	No mitigation needed.
Using direction from the land claim, in collaboration with Champagne and Aishihik First Nations and the Kluane National Park Management Board, develop a management and regulatory approach to First Nation harvest and trapping in the park.	⇧ Management and regulation of harvest and trapping should ensure these activities are undertaken in manner that does not generate significant adverse effects to populations or ecosystems.	⇧ Increased clarity regarding management and scope of First Nations harvest and trapping activities in the park. ⇩ Parks Canada staff and public resentment over harvest and trapping activities occurring in a protected area. ⇩ Backcountry visitors may encounter aggressive bears feeding on gut piles and harvested remains, especially on existing hiking trails.

6.2 First Nations Traditional Uses

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
		Mitigation measures can be prescribed once specific details of harvest activities are known. Regulatory tools such as "No Harvest Zones" are in place and will continue to be utilized.		Communicate with the public and stakeholders on the outcomes of management decisions affecting harvest and trapping activities. Backcountry orientation should contain information on FN harvest activities and what travelers may encounter in the backcountry. Monitor number of comments, complaints and bear -human encounters to determine if harvest activities are increasing number of aggressive encounters. Guidelines for appropriate disposal of harvest remains should be developed in consultation with FN if monitoring indicates significant number of problems are occurring.
Jointly, Champagne and Aishihik First Nations and Parks Canada will educate First Nations members and park staff about CAFN members' rights from the land claim, related to the park.	⇔	No direct impacts anticipated.	⇧ ⇩	Improved understanding of First nations rights by all parties with an interest in the matter. Public and stakeholder resentment over exclusive First Nations rights. Perception of rights and privileges based upon class distinctions.
		No mitigation needed.		Education should extend beyond First Nations and park staff to include public as well. Adequate knowledge and understanding of land claim rights is essential to gaining public support.
The No Harvest Zones will be reviewed by Champagne and Aishihik First Nations, the Kluane National Park Management Board and Parks Canada.	⇔ ⇧	No direct impact anticipated. Adjustments to no harvest zones should be based on need to minimize ecological impacts of these activities to ensure sustainable long-term populations.	⇧	Co-management approach to management of No Harvest Zones should foster enhanced working relationships between First Nations and Parks Canada.
		An adaptive management approach should be employed. Furbearer and ecosystem data from monitoring should be used to refine No Harvest Zones.		All changes to no harvest zones should be communicated in a timely manner to all parties with an interest in the matter.

6.3 Current and Future First Nations Opportunities

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Work with First Nations' governments to ensure that employment and training opportunities presented through the operation of Kluane National Park and Reserve result in the successful recruitment and retention of aboriginal employees.	⇔	No direct impacts anticipated.	⇧ ⇧	Increased opportunity for First Nations employment. Increased proportion of First Nations Parks Canada employees is an expected outcome. Positive social and economic (income) benefits to First Nations persons and communities.
		No mitigation needed.		Recruitment and retention of First Nations employees is one component of the Employment Equity initiatives of the federal government. Hiring aboriginal employees will assist Parks Canada to fulfil requirements of the *Employment Equity Act.* Parks Canada's approach to employment equity is outlined in a publication entitled *Parks Canada Strategy and Action Plan For Visible Minorities*.
Ensure that the potential economic benefits of new management initiatives, like the ecological monitoring program, are factored into program design and implementation.	⇔	No direct impacts anticipated.	⇧ ⇧ ⇩	Increased opportunity for First Nations employment. Positive social and economic (income) benefits to First Nations persons and communities. Increased knowledge of protected areas management techniques and acquisition of marketable skills. Potential reduced opportunities for non First Nation persons or companies.
		No mitigation needed.		No mitigation needed.
Utilize the provisions of the *Champagne and Aishihik First Nations Final Agreement* and Canada's *Aboriginal Procurement Policy* to ensure that identified economic benefits of park operations through contract are realized by First Nations members and businesses.	⇔	No direct impacts anticipated.	⇧ ⇩	Increased opportunity for First Nations employment and businesses. Positive social and economic (income) benefits to First Nations persons and communities. Non First Nations persons or businesses may perceive themselves to be at a competitive disadvantage.
		No mitigation needed.		Make information on the Final Agreements and federal Procurement Policy readily available to all parties. Include this information in all contract tendering processes for Kluane NP&R.

6.3 Current and Future First Nations Opportunities

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Work with Champagne and Aishihik First Nations to pursue the development of a sales outlet in the Haines Junction Visitor Reception Centre to feature First Nations arts and crafts and cultural information as well as profile cultural tourism opportunities to visitors.	⇔	No direct impacts anticipated.	⇧ ⇧ ⇧	Increased opportunity for First Nations employment and businesses. Positive social and economic (income) benefits to First Nations persons and communities. Increased public knowledge and understanding of First Nations culture in the region. Increased knowledge and understanding of present and past role of First Nations in the greater Kluane region.
		No mitigation needed.		No mitigation needed.
Ensure that opportunities exist for First Nations operators to enter into rafting, boat tour, shuttle service, and other tourism services, as the First Nations tourism sector develops in the region.	⇔ ⇩	It isn't possible to accurately predict environmental impacts at the present time as the concept is vague in the management plan. A motorized boat shuttle has been used twice in the past during emergency situations. Tourism activities have the potential to negatively impact the receiving environment.	⇧ ⇧ ⇩ ⇧	Increased opportunity for First Nations employment and businesses. Positive social and economic (income) benefits to First Nations persons and communities. First Nations tourism will provide a new perspective to tourism in the greater Kluane area. Greater opportunities for First Nations messaging and content during tours will be available. Non First Nations businesses may perceive themselves to be at a competitive disadvantage. Increased public knowledge, understanding and support for protected areas such as Kluane National Park and Reserve.
		Existing recreation management tools such as Appropriate Activities Framework should be used to ensure proposed undertakings are compatible with Parks Canada policy and within the ecological and social carrying capacity of Kluane NP&R. Motor boating activities should be carried out in a manner that minimizes impacts to wildlife, aquatic resources, air quality and visitor wilderness experience. *Protecting the Aquatic Environment: A Boater's Guide* is one suggested source of information on this subject.		Make information on the Final Agreements and federal Procurement Policy readily available to all parties. Include this information in all contract tendering processes for Kluane NP&R.

6.3 Current and Future First Nations Opportunities

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Work with First Nations' governments to ensure that cultural information resulting from research in the park is available and used to benefit development of First Nations cultural tours. Priority may be put on cultural research, such as aboriginal trail systems, that leads to development of cultural tourism.	⇔	No direct impacts anticipated	⇧	Improved understanding of First Nations cultural heritage. First Nations tourism will provide a new perspective to tourism in the greater Kluane area. Greater opportunities for First Nations messaging and content during tours will be available.
	⇩	Increased visitation or demand for services in Kluane NP&R may result.	⇧	Development of a cultural tourism business sector will increase employment and business opportunities for First Nations. Positive social and economic (income) benefits to First Nations persons and communities are expected.
		Cultural tourism activities within Kluane NP&R will be subject to existing human use management tools in place. Development of the cultural tourism sector is not expected to result in significantly greater numbers of park visitors.		Sensitive cultural resource information will not be publically available to minimize vulnerability of resources to theft, intentional vandalism or destruction.
All licenced business operating in Kluane National Park will be made aware of Parks Canada's obligations under the *Champagne and Aishihik First Nations Final Agreement* to ensure economic benefits. Businesses will be encouraged to partner with First Nations operations, and consider the importance of local purchasing and employment towards support for the tourism sector and protected areas within the traditional territory.	⇔	No direct impacts anticipated.	⇩	Non First Nations businesses may perceive themselves to be at a competitive disadvantage.
			⇧	Partnerships and cooperative working relationships between First Nations businesses and other local businesses may develop. Increased cross-cultural knowledge, understanding and mutual respect for diverse cultures may result.
		No mitigation needed.		Make information on the Final Agreements and federal Procurement Policy readily available to all parties. Include this information in all contract tendering processes for Kluane NP&R.

6.3 Current and Future First Nations Opportunities

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Opportunities to expand First Nations' involvement with filming activities in the park will be explored.		Difficult to predict specific impacts based on vague concept in the management plan.	⇧	Opportunity for First Nations employment and development of marketable and transferable skills.
			⇧	Opportunities to create films profiling First Nations culture, persons or issues may emerge. Increased public knowledge and understanding of First Nations peoples may result.
		Film activities may be subject to review of environmental impacts under the *CEAA*. Projects with significant adverse environmental effects will not be approved. *Film & Video Guidelines, Parks Canada - Yukon Field Unit* will be used to manage activities. The application and review process evaluates the impacts of filming activities on the environment, heritage resources, visitor experience, and park operations and administration.		No mitigation needed.

6.4 Heritage Tourism

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Work with governments and businesses to ensure that tourism products and services are compatible with, and highlight the park's natural environment and cultural resources.	⇔	No direct impacts anticipated.	⇧	Visitor expectations are matched to service offer. Enhanced levels of visitor satisfaction may result.
		No mitigation needed.		No mitigation needed.
Foster and support First Nations' efforts to deliver cultural heritage programs and products that focus upon their historic and contemporary associations with the park.	⇔	No direct impacts anticipated.	⇧	Increased public knowledge and understanding of First Nations cultural association with Kluane NP&R.
		No mitigation needed.		No mitigation needed.
Work with governments and businesses to ensure that ecological integrity messages are incorporated into marketing efforts related to the park.	⇔	No direct impacts anticipated.	⇧ ⇧	Positive economic benefit to local and regional businesses. Increased public understanding of EI may result. Public support for Kluane NP&R may increase.
		No mitigation needed.		No mitigation needed.
Use the park Website to link potential visitors with other heritage sites and opportunities in the region.	⇔	No direct impacts anticipated.	⇧ ⇧	Promotion of other heritage sites may generate more business for them and result in positive economic benefit to local and regional businesses. Expectations of Kluane NP&R visitors are matched to park service offer. Enhanced levels of visitor satisfaction may result.
		No mitigation needed.		No mitigation needed.

6.4 Heritage Tourism

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Work with the tourism industry to promote learning travel opportunities associated with the park.	⇔	No direct impacts anticipated. Increased visitation to Kluane NP&R may result.	⇧ ⇧	Enhanced working relationship between the tourism industry and Kluane NP&R. Increased knowledge, understanding and support for the park in the region may result. Increased visitation to Kluane NP&R and the region is a positive economic benefit to local and regional businesses.
		Significant increases in visitation are not expected. Majority of increased use will occur in the front-country, highway corridor portion of Kluane NP&R. These areas are zoned for and most capable of supporting heavy use. Utility infrastructure capacity may become an issue. System provides adequate treatment but is near maximum capacity.		No mitigation needed.

6.5 Interpretation and Outreach

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Maintain Haines Junction and Sheep Mountain Visitor Reception Centres as the focal points for interpretation and presentation.	⇔	Status Quo. No impacts anticipated.	⇔	Status Quo. No impacts anticipated.
		No mitigation needed.		No mitigation needed.
Continue the re-development of the Haines Junction VRC to ensure: key messages about the park are delivered in an effective manner; basic orientation and safety information is available 24 hours a day, year round and that the delivery of information is more efficient.		Difficult to predict specific impacts based on vague concept presented in the management plan.	⇧	Positive economic benefit for planners, architects, builders, suppliers, and heritage communication consultants.
		Impacts of proposed undertakings will be assessed under the CEAA and documented in a screening report. Impacts of renovation and construction activities are well known and mitigable with known technology.		No mitigation needed.
Work with CAFN to develop a sales outlet in the VRC.	⇔	No direct impacts anticipated.	⇧ ⇧	Positive economic benefit (income) to local CAFN. Positive social benefit (employment) to CAFN.
		Minor interior renovation of the VRC may be required. Impacts of renovation are predictable and mitigable with known technology.		No mitigation needed.
Work with CAFN and KFN to establish appropriate culturally-based interpretive themes and programs with an emphasis on delivery by CAFN and KFN members. Delivery could be by First Nations park staff, on contract, as part of a First Nations business.	⇔	No direct impacts anticipated.	⇧ ⇧	Potential employment opportunities for First Nations. Positive social benefit from increased communication and awareness of First Nations past and present role in the area.
		Minor interior renovation of the VRC may be required. Impacts of renovation are predictable and mitigitible with known technology.		No mitigation needed.

6.5 Interpretation and Outreach

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Include Southern Tutchone as a third language in interpretive displays and signage in the park where the history and culture of CAFN and KFN is highlighted.	⇔	No direct impacts anticipated.	⇧	Positive social benefit from increased communication and awareness of First Nations past and present role in the area.
		Minor renovation of the VRC, signs and interpretive displays may be required. Impacts of these activities are predictable and mitigitible with known technology. Impacts of proposed modifications will be assessed prior to undertakings these activities and documented in a screening report.		No mitigation needed.
Identify and develop interpretation programs and products with local residents as a key audience. Examples could include presentations on park research, avalanche awareness courses and family-oriented snowmobile trips (see 6.8.8 Winter Experience).	⇔	No direct impacts anticipated.	⇧	Increased knowledge and understanding of Kluane NP&R. Local and regional support for the park may increase.
		No mitigation needed.		No mitigation needed.
Develop school programs about the park, which can be incorporated into school curricula, with a focus on local schools.	⇔	No direct impacts anticipated.	⇧	Increased knowledge and understanding of Kluane NP&R. Local and regional support for the park may increase.
		No mitigation needed.		No mitigation needed.
Work with commercial operators and tour bus drivers to develop programs and products that encourage and support operators in delivering key park messages to their clients.	⇔	No direct impacts anticipated.	⇧	Increased knowledge, understanding, and support of Kluane NP&R.
		No mitigation needed.		No mitigation needed.
Develop and deliver an interpretation certification program for commercial guides willing to deliver key park messages to their clients.	⇔	No direct impacts anticipated. Increased levels of appropriate, low impact, behaviour from visitors to the protected area	⇧	Increased knowledge, understanding, and support of Kluane NP&R.
		No mitigation needed.		No mitigation needed.

6.5 Interpretation and Outreach

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Enhance the park's Website to reach audiences that do not visit the park so they can gain an awareness of the park and the challenges faced, and learn how they can actively contribute to solutions.	⇔	No direct impacts anticipated.	⇧	Increased knowledge, understanding, and support of Kluane NP&R.
		No mitigation needed.		No mitigation needed.
Develop and implement methods to regularly measure the success of interpretation and outreach programs and products, and revise the programs and products as required.	⇔	No direct impacts anticipated.	⇧	Feedback loop of measurement - program refinement - measurement is likely to improve the performance of interpretation and outreach programs and products.
		No mitigation needed.		No mitigation needed.
Coordinate the redevelopment and development of roadside pull-off exhibits with the Interpretive Signage Plan for the Alaska Highway west, pending from the Yukon government.	⇔	Impacts during construction activities are expected to be minor and of short duration. Projects will occur within existing developed highway right-of-way. Project impacts are known, predictable and mitigitible with known technology. Projects are likely exempt from the CEAA pursuant to Schedule II section 8 of the Exclusion List Regulations.	⇧	Increased visitor satisfaction
		Preparation of a non-CEAA environmental assessment would fulfil Parks Canada Policy objectives of exemplary use of EA.		No mitigation needed.

6.6 Visitor Services and Facilities

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Continue to partner with others for the shared delivery of tourist information at the Haines Junction Visitor Reception Centre (VRC).	⇔	Status Quo. No direct impacts anticipated.	⇔	Status Quo. No direct impacts anticipated.
		No mitigation needed.		No mitigation needed.
Maintain the Haines Junction VRC as a year-round visitor information facility.	⇔	Status Quo. No direct impacts anticipated.	⇔	Status Quo. No direct impacts anticipated.
		No mitigation needed.		No mitigation needed.
Maintain the Sheep Mountain VRC as a seasonal visitor information facility.	⇔	Status Quo. No direct impacts anticipated.	⇔	Status Quo. No direct impacts anticipated.
		No mitigation needed.		No mitigation needed.
Collaborate with tourism operators, authorities and local businesses to provide visitors with orientation to services, programs and events available in the local communities and surrounding region.	⇔	No direct impacts anticipated.	⇧	Greater public awareness of local services and events may increase number of customers and result in positive economic benefit for local and regional businesses.
		No mitigation needed.		No mitigation needed.
Work with YTG, FN and local communities to improve visitors' "sense of arrival" to the park.	⇔	No direct impacts anticipated.	⇧	Increased visitor understanding of types of services and experiences available. Increased levels of visitor satisfaction may result.
		No mitigation needed.		No mitigation needed.
Redevelop and develop trailhead facilities at popular trails which integrate orientation, interpretation, safety and ecosystem information.		Impacts during construction activities are expected to be minor and of short duration.	⇧ ⇧	increased visitor satisfaction increased knowledge and understanding of human use impacts and low impact behaviors.
		Construction impacts are known, predictable and can be mitigated with known technology. These sites are already disturbed and used for this purpose.		No mitigation needed.

6.6 Visitor Services and Facilities

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Measure visitor use, motivation and satisfaction on a regular basis.	⇔	No direct impact anticipated.	⇧	improved understanding of visitors affords opportunity to communicate PC mandate and/or target service offer and increase visitor satisfaction.
		No mitigation needed.		requests for additional facilities, services and activities need to be assessed within appropriate activities framework and management planning exercises. Not all requests can be fulfilled.
Develop and implement an appropriate activities framework for the park. The framework will evaluate proposed new park activities against a list of criteria to determine if the activity is appropriate for the park, as well as define where and under what conditions the activity could take place.		Process evaluates candidate activities against criteria such as : consistency with Parks Canada policy and legislation; impacts to other users; impacts to the environment; and level of personal risk involved. Activities with unacceptable impacts will not be permitted within Kluane NP&R.	⇧ ⇩	Clear direction to the public and stakeholders regarding types of permissible and prohibited activities within Kluane NP&R. Individuals or groups partaking in activities deemed to be inappropriate in Kluane NP&R may feel they have been unfairly excluded from the park.
		Process is self mitigating by nature. Additional information is available in the 1994 Parks Canada publication *A Proposed Framework for Assessing the Appropriateness of Recreation Activities in Protected Heritage Areas.*		Results of appropriate activities framework assessments should be communicated to target audiences (e.g. eco challenge organizations) and the general public in a timely manner.

6.6 Visitor Services and Facilities

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Use the "Film and Video Guidelines, Parks Canada – Yukon Field Unit" to review applications for commercial filming in the park. They include the provision that public uses in the park take precedence over filming activities.	⇧	Film activities will be regulated to ensure significant impacts to the environment, cultural resources, visitor experience, and park operations do not occur.	⇧	Clear direction regarding permissible and prohibited filming activities within Kluane NP&R will benefit film production companies and decrease likelihood of unrealistic requests.
	⇩	Most filming in Kluane NP&R requires aircraft use. Aircraft are used to ferry crews and equipment to and from shoot locations and as a filming platform when recording aerial footage. When added to existing aircraft use (park operations, Icefields expedition support, rafting support, flight-seeing), the cumulative effects upon wildlife may be significant. Research conducted on Dall's sheep in and around Kluane NP&R indicates animals show a range of behavioral responses to fixed wing and rotary aircraft overflights. Few peer reviewed studies have been published that conclusively demonstrate direct cause and effect relationships between aircraft use and impacts to ungulate populations. Despite this, the body of evidence from the Grey literature and published literature appears to indicate repeated exposure to aircraft can significantly effect wildlife population viability.	⇧	Increased understanding of mandate of Kluane NP&R may lead to more interest in producing media that profile the park. Increased public awareness and support for the park may result.
			⇧	Evaluation and processing of commercial filming applications should be cost neutral or positive for Parks Canada. Review Application fees will offset staff costs.

6.6 Visitor Services and Facilities

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
	The Canadian Environmental Assessment Act and Regulations have no direct trigger for filming activities. The CEAA will only be triggered in cases where a business license is issued by Parks Canada or where aircraft access to remote parts of a wilderness area is required (section I Inclusion List regulations). In situations where the CEAA is not triggered, a non-CEAA environmental assessment should be prepared to fulfil Parks Canada Policy objectives of exemplary use of EA. Many filming requests involve aircraft use and landings within Kluane NP&R. The Parks Canada document *Generic Environmental Assessment of Aircraft Landings in Canadian National Parks and National Historic Sites* can be used as the basis for a project specific EA or when assigning filming permit conditions. Parks Canada should adopt a cautious approach to approving additional use of aircraft within Kluane NP&R.	No mitigation needed.
Provide opportunities for a private operator to make canoes and/or kayaks available for rent at a few backcountry lakes such as Louise Lake, Mush Lake, Bates Lake and St. Elias Lake.	Status quo Impacts of self-propelled water activities are minor. No use of oil and gas is involved, no significant wakes are generated and noise levels are low. ⇩ Close approaches to wildlife and waterfowl may lead to temporary nest abandonment, flight to marginal habitat or other behavioral responses. Probable frequency, magnitude and duration of impacts is likely minor. ⇩ Increased sport fish harvest.	⇧ potential positive economic benefit to private operators. ⇧ Local employment opportunity. ⇩ conflicts between motorized and non-motorized users are possible on lakes where both activities are permitted.

6.6 Visitor Services and Facilities

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
		Monitor levels of use. Provide pre-trip and trail-head onsite orientation information describing impacts of water based activities on wildlife and appropriate low impact behaviour for park visitors.		Monitor types and frequency of user conflicts Provide pre-trip and trail-head onsite orientation information describing impacts of water based activities and means to avoid conflicts with other user groups (motorized vs. Non-motorized).
Early in the implementation of the management plan and with public consultation, update the Park User Fee Policy.	⇔	No direct impact anticipated.	⇧ ⇩	potential positive economic benefit to PC negative reaction from public and tourism operators to changes in fees.
		No mitigation needed.		Studies conducted by Parks Canada and others indicate the public is more receptive to user fees if proceeds are reinvested in they area or program where they are collected. Communications regarding changes to the Park User Fee Policy should state that fees will be reinvested in Kluane NP&R programs.
Use visitor surveys and current market research to evaluate if the services and facilities provided are meeting the needs of visitors.	⇔	No direct impact anticipated.	⇧ ⇩	Improved knowledge and understanding of visitor needs may be used to improve the service offer. Increased levels of visitor satisfaction may result. Survey respondents requesting services inappropriate for Kluane NP&R may feel frustrated due to unfulfilled needs and perceived lack of response to their request.
		No mitigation needed.		Not all needs can be fulfilled. Requests for additional services must be evaluated for consistency with Parks Canada policy and potential for environmental impacts. If surveys request suggestions for additional types of services from respondents, the survey method should contain information explaining not all suggestions can be acted upon.

6.6 Visitor Services and Facilities

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Use the park's Website more effectively to communicate to commercial operators and potential operators as a defined target group.	⇔	No direct impacts anticipated	⇧ ⇧	Easier access to pre-trip planning materials for operators and their clients. Improved knowledge and understanding of Parks Canada mandate, human use restrictions, permissions and other regulatory tools in place in Kluane NP&R.
		No mitigation needed.		No mitigation needed.
Meet regularly with members of the tourism industry e.g. Yukon Tourism, Wilderness Tourism Association, Tourism Industry, to facilitate communication and understanding of KNP&R values, goals, and objectives.	⇔ ⇧	No direct impacts anticipated. Increase in compliant and appropriate behaviour may occur resulting in lower levels of human use impact from Kluane NP&R visitors.	⇧	Improved knowledge and understanding of Parks Canada mandate, human use restrictions, permissions and other regulatory tools in place at Kluane NP&R.
		No mitigation needed.		No mitigation needed.
Work in collaboration with Yukon Government Tourism officials to prepare an information and awareness guide for conducting commercial tourism operations in the park.	⇔ ⇧	No direct impacts anticipated. Increase in compliant and appropriate behaviour may occur resulting in lower levels of human use impact from Kluane NP&R visitors.	⇧	Improved knowledge and understanding of Parks Canada mandate, human use restrictions, permissions and other regulatory tools in place in Kluane NP&R. Increased support for Kluane NP&R may result.
		No mitigation needed.		No mitigation needed.

6.7 Effective Recreational Use Management

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Prohibit the following activities as they are not consistent with park values and experiences: Personal watercraft (seadoos); heli-skiing; heli-hiking; recreational use of ATVs; hand-gliding; and extreme multi-day adventure races.	⇧	Net effect on integrity of natural and cultural resources will be positive. Prohibiting these activities will reduce levels of noise, air and water pollution, wildlife harassment, vegetation trampling, soil and shore erosion in Kluane NP&R.	⇧ ⇧ ⇩	Reduced need for costly and risky search and rescue missions. Reduced probability of user group conflicts between those seeking wilderness or solitude and those seeking thrills. Lost opportunity cost to guides, outfitters and equipment dealers offering extreme sport services or goods.
		No mitigation needed. Prohibition of these activities is consistent with Parks Canada legislation and policy.		Adequate opportunities for these activities exist outside of Kluane NP&R. Information detailing prohibitions should be readily available to the public at the Kluane NP&R website, and visitor centres. Direct communication with representatives of groups undertaking these activities should be considered. This will offer an opportunity to explain PC mandate, suggest alternative areas to undertake these activities and lessen the potential for illegal undertaking o f activities within Kluane NP&R.

6.7 Effective Recreational Use Management

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
Continue to permit llama use under tight restrictions and continue monitoring the activity.	⇩ Dispersal of exotic plants seeds in llama feed may lead to establishment of viable non-native plant populations along travel corridors in Kluane NP&R. Vegetation community structure and wildlife habitat suitability may be negatively effected as a result. Many non-native plants are often invasive and difficult or impossible to eradicate once established. ⇩ Transmission of infectious animal diseases from llamas to native wildlife in the park. Llama are carriers of paratuberculosis (Johnes's Disease). There are no confirmed cases of transmission to wild animals. ⇩ Vegetation trampling, soil compaction and subsequent erosion may occur from llama traffic. ⇩ Browsing of park vegetation by llamas may lead to changes in seral states of vegetation and altered habitat suitability for native wildlife species.	⇩ Some users may object to llama use in protected areas. Common concerns include spread of viable non-native plant seeds and transmission of infectious animal diseases to wildlife. This may result in reduced quality visitor experiences. ⇩ Costly control programs for non-native plants may be needed if populations become established within the park. ⇧ Llama owners, guides and outfitters will continue to have access to Kluane NP&R. ⇧ Use of Llamas within Kluane NP&R will increase visitor experience quality for some users. ⇩ Llama diseases such as Leptospirosis can be passed on to humans (zoonotic diseases). Potential exists for an asymptomatic animal (presenting no symptoms of disease) to enter the park and contaminate water bodies resulting in human contraction of disease.

6.7 Effective Recreational Use Management

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
	Llama Use Guidelines for Kluane National Park And Reserve, May 1997 were developed to permit limited llama use in the park on a trial basis. The guidelines contain restrictions on routes, group size, and season of use. Management of the activity should be refined based on monitoring results in an adaptive management approach. Methods to decrease the probability of exotic seed dispersal include quarantine of animals at trailheads for several days to ensure all feed that may contain viable seeds has been eliminated from the digestive system prior to entry into the park. Use of pellet feed with no seeds and/or browsing of park vegetation for food source in the Park. Range management training should be provided to Parks Canada staff involved with management of llama use as recommended in the publication *Improving Livestock Management in Wilderness*. Llama use has been restricted to limited personal recreational use to date. Commercial outfitting interests may arise in the future. The *National Parks Domestic Animal Regulations* govern entry of llamas into national parks. Section 3(1)(b) states: No person shall bring into a park or keep in a park any horses, donkeys, mules or llamas unless the use of such animals is authorized by a licence issued under the *National Parks Businesses Regulations*. Section 3 (2)(c) states: No person shall, except as authorized by a permit, graze a horse, donkey, mule or llama in a park. Need for a business licence triggers the CEAA. Any proposed commercial llama use is therefor subject to a CEAA environmental assessment prior to approval and undertaking of these activities. Personal recreational use of llamas does not trigger the *CEAA*.	Proactive communications program to inform visitors regarding llama use within Kluane NP&R. This will decrease the potential for user group conflicts on the trail. Health of llamas should be checked prior to admission into the park.

6.7 Effective Recreational Use Management

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
Develop a quota and reservation system for KNP&R that initially focuses on the Slims, Cottonwood, Alsek, and Donjek/Duke visitor use corridors.	⇧ Decreased number of bear-human conflicts and reduced need for handling (immobilization, relocation, destruction) which disrupts ursid social order. Handling operations often negatively impact bear social order and put individuals and family groups at risk (e.g. relocation to sub-optimal habitat; mortality to relocated bears trying to establish home range that is already occupied; break up of family groups especially where sow is with cubs). ⇧ Reduced displacement of grizzly bears from critical security area habitat because of human activities. ⇧ Net effect of recreational use management tools will be an improved level of ecological integrity and higher probability of long-term survival of grizzly bears within Kluane NP&R.	⇧ Backcountry party encounter rates will be low. Solitude and high quality wilderness experiences are assured for visitors seeking these experiences. ⇧ Campsites will be closed in areas with high risk of bear-human encounters. Adequate bear proof food canisters will be available for all parties traveling in these corridors. These actions are likely to decrease the number of bear-human conflicts. Reduced property damage, and human and wildlife mortality is expected. ⇧ Potential reduced need for grizzly bear handling (immobilization, relocation, destruction) that is risky for staff involved. ⇩ Some backcountry users will be annoyed if they are unable to secure a reservation for a planned backcountry trip. ⇩ Some guides and outfitters offering wilderness backcountry trips may object to quota limits. Quotas will restrict the number of clients commercial outfitters can service and may negatively effect the economic viability of their business. ⇩ Some outfitters may claim inequitable allocation of quota to other parties or companies.
	No mitigation needed.	Rationale for the quota needs to be clearly articulated to the public and outfitters. An objective and fair method of quota allocation would assist acceptance of the system.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
6.8.1 Mush and Bates Lakes				
Maintain the Mush Lake road to provide reliable seasonal access for 4x4 trucks similar to early 1990s standards.	⇔	Status Quo.	⇩	User group conflict may arise where simultaneous use by recreationists and First Nations groups undertaking traditional subsistence activities occurs. Conflicts between non-motorized and motorized recreationists are also possible.
	⇩	Noise and presence of vehicles and humans may lead to short-term wildlife abandonment of habitat near the road corridor.		
	⇩	Consistent reliable access may lead to increased levels of human use. Increased fishing pressure on Mush and Bates Lakes may occur.	⇩	Backcountry visitors hiking or mountain biking the road corridor may encounter aggressive bears feeding on gut piles and harvested remains.
		Present visitor use is low (avg = 16 overnight parties annually). Visitor use patterns should be monitored to determine if significant changes in levels of use are occurring. Human use management tools may be needed in future if use increases significantly and monitoring indicates resource impairment is occurring.		Backcountry orientation should contain information on FN harvest activities and what travelers may encounter in the backcountry. Monitor number of comments, complaints and bear -human encounters to determine if harvest activities are increasing number of aggressive encounters. Guidelines for appropriate disposal of harvest remains should be developed in consultation with FN if monitoring indicates significant number of problems are occurring.
Minimize noise and hydrocarbon emissions on Mush Lake by limiting boat motors to 4 stroke engines only (or equivalent) by the year 2005.	⇧	Decreased discharge of hydrocarbon emissions into Mush Lake per unit of engine operating time. Potential exists for decreased levels of hydrocarbon contamination of surface water and sediments. Net effect upon lake water quality is dependant upon differences in engine emissions and magnitude, frequency and duration of engine use on the lake.	⇩	Some users will object to mandatory use of 4 stroke or equivalent low emission engines as they will incur expenses modifying existing equipment or purchasing new equipment to meet the standard.
	⇧	Decreased engine noise per unit of engine operating time. Lower levels of engine noise may result in less displacement behaviour by waterfowl and other wildlife in and around Mush Lake.	⇧	Lower noise and hydrocarbon emissions should reduce the potential for conflict between motorized and non-motorized users at Mush Lake.
		Mush and Bates Lakes should be included in the aquatic ecosystem monitoring program. Fish population and water quality monitoring data would aid determining if significant changes are occurring and allow timely management responses.		No mitigation needed.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Permit only non-motorized use by visitors on Bates Lake.	⇔	No direct impacts anticipated. Status Quo.	⇔	No direct impacts anticipated. Status Quo.
	⇧	Prohibiting motorized use of Bates Lake will reduce levels of noise, air and water pollution, wildlife harassment, shore erosion, and sport fish harvest on Bates Lake. Net effect on integrity of natural and cultural resources will be positive.	⇧	Continued opportunity for visitors to enjoy natural quiet.
		No mitigation needed.		Adequate opportunities for motorized boating are available on other lakes inside and outside of Kluane NP&R.
6.8.1 Cottonwood Trail				
Designate safer campsites to replace those that must be closed to reduce negative human/bear interactions.	⇧	Decreased number of bear-human conflicts and reduced need for handling (immobilization, relocation, destruction) which disrupts ursid social order. Handling operations often negatively impact bear social order and put individuals and family groups at risk (e.g. relocation to sub-optimal habitat; mortality to relocated bears trying to establish home range that is already occupied; break up of family groups especially where sow is with cubs).	⇧	Campsites will be closed in areas with high risk of bear-human encounters. Decreased numbers of bear-human conflicts, reduced property damage, and human and bear mortality is expected.
			⇧	Potential reduced need for bear handling (immobilization, relocation, destruction) that is risky for Parks Canada staff.
			⇧	Cost savings to Kluane NP&R if reduced numbers of bear management actions are required.
	⇧	Reduced displacement of bears from critical security area habitat.	⇧	Reduced need for trail closures resulting from bear-human encounters or unacceptably high risk of serious encounters. Fewer backcountry parties will be negatively impacted by having to make last minute changes to planned trip itineraries.
	⇧	Net effect of campsite designation will be an improved level of ecological integrity and higher probability of long-term survival of bears in the Cottonwood Trail corridor and Kluane NP&R.		
	⇩	Campsite designation will result in higher levels of campsite use and less opportunity for sites to recover between uses. Site degradation is likely to occur. Common degradation impacts include increased area of exposed soil, fire rings, privy holes, vegetation trampling and removal.	⇩	Designated campsites will receive relatively higher levels of use and therefor may experience degradation. This may negatively impact campsite aesthetics and wilderness experience for visitors.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
		Backcountry orientation and trailhead information should contain advice on low impact camping methods appropriate to wilderness areas.		Inform the public in a timely manner once designated campsite locations and campsite closure locations have been determined.
6.8.2 Kathleen Lake				
Maintain the current range of services and facilities at existing levels.	⇔	No direct impact anticipated. Status Quo.	⇔	No direct impact anticipated. Current services and facilities will continue to be offered.
		The impacts of existing levels of use should be monitored to determine if resource impairment is occurring to Sockeye Lake habitat for grizzly bear and moose. Assess the environmental impacts of boating activity on Kathleen lake aquatic ecosystem and prescribe management actions to eliminate or reduce those impacts. A substantial body of literature on impacts of recreational boating and best management practices is available. Recommended references include the US EPA Publication *National Management Measures to Control Point Source Pollution from Marina and Recreational Boating*; *Protecting the Aquatic Environment: A Boater's Guide* and *Generic Assessment of Boating Activities in National Parks*.		No mitigation needed.
6.8.3 Dezadeash - Alsek Valleys				
Continue to manage the Alsek River as a premier wilderness rafting experience by allocating no more than 15 departures a month (departures scheduled about every second day) to private or commercial river runners.	⇔ ⇧	Status Quo. No direct impacts anticipated. Human use impacts to grizzly bear and other VEC's in the Alsek will be kept at levels that do not significantly impact these resources.	⇔ ⇧	Status Quo. No direct impacts anticipated. Commercial river runners are familiar with the existing management approach in place on the Alsek River. High quality wilderness experiences on the Alsek will continue to be available.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
		The number of departures should be reduced or other management tools put in place if impact monitoring results indicate resource impairment is occurring.		No mitigation needed.
Subject to submission of a business proposal including an environmental assessment, a Champagne and Ashihik First Nations member will be permitted to offer a motor supported float trip service on the Dezedeash River between Haines Junction and Serpentine.		Difficult to predict specific impacts based on vague concept presented in the management plan.	⇧	Positive economic opportunity for First Nations member.
		The environmental impacts of the proposal will be assessed prior to approval. The assessment should consider development of an operating protocol that includes: size and type of vessel, frequency of use, schedule use, route specification, type of motor and other equipment, fuel cache location and fueling protocol. The Parks Canada document *Generic Assessment of Boating Activities in National Parks* can be used as the basis for a project specific EA. The impacts of these activities upon moose calving and swan nesting should be assessed.		No mitigation needed.
KNP&R will cooperate with the Yukon Government and stakeholder to maintain the Alsek River road to provide reliable seasonal 4 x 4 vehicle access.		Status Quo. No culverts but repairing the holes related to stream erosion and channel building.	⇩	Conflicts between 4x4 vehicles, mountain bikes, and hikers where simultaneous use occurs
		Maintenance activities are limited to repair of holes in the road bed from stream erosion and in-filling of large potholes.		Provide pre-trip and trailhead information that informs users of the types of activities permitted on the road and means to minimize user group conflicts.
6.8.4 Slims River Valley				

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Designate campsites in the Slims River Valley to help reduce negative human/bear interactions.	⇧	Consistent use of sites may lead to reduced bear-human conflicts. Human behaviour will be more predictable and consistent to bears.	⇧	Backcountry party encounter rates will be low. Solitude and high quality wilderness experiences are assured for visitors seeking these experiences.
	⇧	Decreased number of bear-human conflicts and reduced need for handling (immobilization, relocation, destruction) which disrupts ursid social order. Handling operations often negatively impact bear social order and put individuals and family groups at risk (e.g. relocation to sub-optimal habitat; mortality to relocated bears trying to establish home range that is already occupied; break up of family groups especially where sow is with cubs).	⇧	Campsites will be closed in areas with high risk of bear-human encounters. Adequate bear proof food canisters will be available for all parties traveling in these corridors. These actions are likely to decrease the number of bear-human conflicts. Reduced property damage, and human and wildlife mortality is expected.
	⇧	Reduced displacement of bears from critical security area habitat.	⇧	Potential reduced need for grizzly bear handling (immobilization, relocation, destruction) that is risky for staff involved.
	⇧	Net effect of campsite designation will be an improved level of ecological integrity and higher probability of long-term survival of bears in the Cottonwood Trail corridor and Kluane NP&R.	⇩	Some backcountry users will be annoyed if they are unable to secure a reservation for a planned backcountry trip.
	⇩	Campsite designation will result in higher levels of campsite use and less opportunity for sites to recover between uses. Site degradation is likely to occur. Common degradation impacts include increased area of exposed soil, fire rings, privy holes, vegetation trampling and removal.	⇩	Designated campsites will receive relatively higher levels of use and therefor may experience degradation. This may negatively impact campsite aesthetics and wilderness experience for visitors.
		Backcountry orientation and trailhead information should contain advice on low impact camping methods appropriate to wilderness areas.		Inform the public in a timely manner once designated campsite locations and campsite closure locations have been determined.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Evaluate alternative measures of protection (such as closure of one side of the valley) if designated campsites, conversion of routes to trails, quotas and reservations, and continued pro-active seasonal temporary closures do not adequately address the bear management issues in the Slims Valley.		This an adaptive management approach to addressing bear-human management issues in the Slims Valley. Net result expected is decrease stress on Slims River valley bear population and increased probability of their long-term survival.		Some guides and outfitters offering wilderness backcountry trips may object to restrictions.
		No mitigation needed.		Inform the public in a timely manner of any changes in management approach.
6.8.5 Duke and Donjek River Valleys				
Recreational use management tools will be implemented to help maintain ecological integrity and wilderness experiences. These include: concentrating use on existing hiking routes and travel corridors; limiting the time a party may spend at the Donjek Glacier; having parties move away from the Big Horn landing site the same day they land; scheduling Big Horn aircraft landings in advance with landings only every second day.	⇧	Critical habitat for grizzly bear, Dall's sheep, moose, and golden eagle will be maintained.	⇩	use restrictions may lead to lost economic opportunities for wilderness guides and outfitters.
	⇧	Rare plant and animal communities in Steel Creek Alpine, Mt Hoge/Donjek Valley, and Duke River Headwaters Special Preservation Areas will be protected.	⇧	Preservation of Wilderness experience characterized by very low party encounter rates, few or no facilities, uninterrupted natural quiet and solitude.
		Effectiveness of management tools should be monitored and refined as necessary.		Inform the public in a timely manner of any changes in management approach.
Investigate if an alternative wheeled landing site can be found in the immediate vicinity of Big Horn Lake.	⇔	Minor variation of Status Quo. No direct impacts anticipated.	⇔	No direct impacts anticipated.
		Volume of aircraft use will not increase.		No mitigation needed. aircraft landings are restricted to one landing every second day to minimise intrusion to wilderness experience of those already on the trail.
6.8.6 The Icefields				

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
KNP&R will work in collaboration with aircraft operators to identify and designate one or two additional multiple operator day use landing sites within the Icefields, subject to guidelines that detail the maximum number of daily landings, flight access routes, and scheduling of landings. The guidelines will ensure this new activity is consistent with the ecological integrity protection and recreational use management principles.	⇩	Wildlife populations may be vulnerable to aircraft disturbance.	⇩	degraded wilderness experience from aircraft overflight intrusions.
	⇩	pollutant emissions during aircraft operation.	⇩	Wildlife displacement in portions of route outside Icefields
			⇧	opportunity for people without wilderness travel skills to experience the Icefields
			⇧	economic opportunity for aircraft charter companies
			⇩	Additional aircraft use will increase the probability of mechanical breakdowns or crashes in remote locations. Potential increased need for search and rescue operations for crashes, medical evacuation of clients if they suffer health complications from landing at moderate to high altitudes, slips or falls into crevasses on bare ice or snow covered glaciers, stranding of clients on glaciers without adequate personal protective equipment or training if weather or aircraft mechanical problems occur while ferrying passengers on multi-load trips.
			⇩	Kluane NP&R staff are exposed to risk while participating in SAR missions. Economic cost of conducting search and rescue missions will be borne by Kluane NP&R.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
		Kluane NP&R has no direct ability to regulate overflights. It is very important for Kluane NP&R to work cooperatively with aircraft operators to develop and implement aircraft guidelines that will ensure maintenance of ecological integrity within the park.		At present approximately 1500 people a year partake in Icefields overflight tours. Parks Canada legislation gives no ability to control overflight numbers. Social carrying capacity of Icefields wilderness experience may be exceeded resulting in loss of solitude and declining visitor experience quality. Ensure Kluane NP&R staff that partake in search and rescue missions receive adequate training, equipment and practice to maintain a high level of proficiency that minimises risks to themselves and clients. (See also 6.8.10 Public Safety and Law Enforcement: improving warden public safety skills). Kluane NP&R may wish to cost recover some or all costs related to provision of search and rescue services.
One additional seasonal tent camp will be permitted in the Icefields subject to submission and approval of a business plan proposal and environmental assessment, and if the current tent camp passes its four year trial period.	⇩	Majority of use at existing camp is day use. Levels of visitor use are presently monitored but not impacts. Potential spills of fuels for cooking facilities and generator, solid waste and human waste disposal.	⇧ ⇩	entrepreneurial business opportunity loss of solitude from aircraft trips, generator noise and encounters with the camp during travel by self-propelled mountaineering groups may lower quality of wilderness experience and feeling of remoteness and isolation.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
	Use monitoring results from trial tent camp to determine the feasibility and impact of an additional tent camp. Restrict types and quantities of fuels that may be used at the camp. Propane appliances and equipment are preferred over gasoline powered. Spills of liquid petroleum fuels may impact snowpack quality and water quality. Propane leaks dissipate to the atmosphere and do not impact water quality. Use 4 cycle or equivalent low emission generator. Convert gasoline generators to propane to reduce risk of liquid petroleum spills. Conversion kits are readily available for most Briggs and Stratton, Craftsman, Honda, and other main manufacturers. (E.g. http://www.propane-generators.com/). Super quiet generators available from Honda. see http://www.hondapowerequipment.com/gensupframe.htm Models such as Honda EU1000i, EU2000i, EU3000i are inexpensive compact. Portable and have noise output ratings in the 50-60 dB range. This is equivalent to noise level of a quite office or normal speech. Waste management guidelines should be developed to minimize environmental impacts of camp operation. Restrict size and type of generators and hours of use. Preference is for solar powered or propane powered appliances with low noise emission levels.	number of daily flights into the Icefields will be restricted.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
KNP&R will work in collaboration with the film industry to identify a pre-approved landing site in the Icefields for filming activities. Individual film proposals for use of this landing site will continue to be subject to environmental assessment approval.	⇔	Status Quo. No direct impacts anticipated	⇧	Film industry will better understand aircraft use permissions and restrictions in the Icefields.
		Specific mitigation measures will be prescribed for individual proposals. The Parks Canada document *Generic Environmental Assessment of Aircraft Landings in Canadian National Parks and National Historic Sites* can be used as the basis for a project specific EA.		No mitigation needed.
6.8.7 Highway Corridor				
Collaborate with Yukon Tourism and other agencies on the concept of a parkway driving experience along the Haines Highway.	⇔	No direct impacts anticipated	⇧	Potential opportunity for Parks Canada messaging and mandate to be incorporated into program materials. Greater public understanding and support of Kluane NP&R may result.
				No mitigation needed.
6.8.8 Winter Experience				
Encourage frontcountry cross-country skiing by regularly track setting the Dezadeash River, Auriol, Kathleen Lake and St. Elias ski trails in partnership with others.		Status quo	⇧	Opportunity for local residents and visitors to experience Kluane NP&R frontcountry using a low impact travel method.
	⇩	Impacts to wildlife and vegetation while track setting.		
	⇩	Noise during snowmobile operation may displace wildlife.		
	⇩	Discharge of exhaust and partially combusted hydrocarbons negatively impact air quality and snowpack quality.		

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
		Restrict track setting to established track rights of way. Operate snowmobiles in controlled manner to reduce opportunities to sudden close encounters with wildlife. Use low emission snowmobiles. Only track set when new snow fall, wind blown snow transfer or track quality requires it. Prohibit snowmobile track setting activities when snow pack conditions are such that impacts to vegetation are likely to occur (i.e. shallow snowpack in early season and shallow or isothermal snowpack in spring) Cross-country skiing is an appropriate activity consistent with Parks Canada policy and legislation.		No mitigation needed.
Encourage backcountry ski touring opportunities by packing the Cottonwood trail 1-2 times a season, after the snow has settled in the spring.	⇩ ⇩ ⇩	Impacts to wildlife and vegetation while track setting. Noise during snowmobile operation may displace wildlife. Discharge of exhaust and partially combusted hydrocarbons negatively impact air quality and snowpack quality.	⇧	Opportunity for local residents and visitors to experience Kluane NP&R frontcountry using a low impact travel method.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
	Restrict track setting to established track rights of way. Operate snowmobiles in controlled manner to reduce opportunities to sudden close encounters with wildlife. Use low emission snowmobiles. Only track set when new snow fall, wind blown snow transfer or track quality requires it. Prohibit snowmobile track setting activities when snow pack conditions are such that impacts to vegetation are likely to occur (i.e. shallow snowpack in early season and shallow or isothermal snowpack in spring) Cross-country skiing is an appropriate activity consistent with Parks Canada policy and legislation.	No mitigation needed.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Recreational use of snowmobiles in the park will not be permitted except along the abandoned pipeline corridor and on Kathleen Lake.	⇩	Noise from snow machines and humans may disturb wildlife. Behavioral responses such as fleeing have high energetic costs because of increased effort to move through winter snowpack. Wildlife subject to frequent disturbance may be adversely affected as winter energy reserves are low (high metabolic cost for maintaining body temperature + low availability of nutritional food sources). Excessive levels of disturbance may result in mortality or reduced fecundity.	⇩	Snowmobile advocates may object to travel restrictions within Kluane NP&R. Some long-term residents regret loss of unrestricted motorized access that existed prior to establishment of Kluane NP&R.
	⇩	Possibility for collision with ungulates. E.g. Moose congregate near the Auriol trail head in early winter.	⇧	opportunities to experience natural quiet, solitude and self-propelled activities will be available throughout the majority of Kluane NP&R.
	⇩	Use of tracked snow reduces energetic travel costs for ungulates and canid predators active in winter. There is no consensus in the scientific community regarding impacts of increased predator mobility on ungulate prey species.		
	⇩	Discharge of partially combusted hydrocarbons. Impacts to air quality, snowpack chemistry, and water quality. Amount of snowmobile use is currently unrestricted so scale of impacts depends on upon magnitude, frequency and duration of snowmobile activity.		
	⇧	Ecological and cultural integrity of Kluane NP&R will benefit from prohibition of snowmobiling outside of Kathleen Lake area.		
	⇧	Some valued ecosystem components or species of special concern are not active in the winter i.e. grizzly bear, swans.		

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
	Kathleen Lake is a Zone 4 (Outdoor Recreation) area. Use of motorized vehicles is permitted in zone 4 areas. Winter creel surveys of Kathleen Lake recreational fishery should be conducted to determine fishing pressure, fishing success, and catch composition. Results can be used to refine management of the fishery as required. Encourage use of 4 stroke low emission ice augers or hand augers for ice fishing activities. Provide pre-trip and trailhead information regarding low impact snowmobile techniques (e.g avoid excessive idling; tune engine regularly). prohibit snowmobile use when shallow snowpack makes vegetation vulnerable to mechanical damage from snowmobile passage. Recreational management techniques (quotas, specified routes) may need to be implemented in future if use levels increase significantly or monitoring indicates resource impairment is occurring. Use of 4 stroke low emission or equivalent snow machines should be encouraged. Alternatively ethanol blend fuel and low emission lubricants can be used. Securing convenient access to ethanol blend fuel may be problematic. Snowmobiling activities will likely not trigger the CEAA or successor environmental assessment legislation. Preparation of a non-CEAA EA would document likely impacts of this activity, means to avoid or lessen impacts, and would fulfill Parks Canada's policy obligation for exemplary use of EA.	No mitigation needed.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
One to two park-sanctioned snowmobile trips may be held annually, targeted to the region's residents.		See key action immediately preceding this one. Management plan does not specify snowmobile routes or destinations but restrict number of events to one or two annually.	⇧	Opportunity for local residents to experience portions of Kluane NP&R by snowmobile as was done prior to park establishment. Some long-term residents regret loss of unrestricted motorized access that existed prior to establishment of Kluane NP&R. Participants are likely to gain increased knowledge and understanding of management issues affecting Kluane NP&R. Increased understanding and support from local residents for management of the site may result. Some Parks Canada staff and stakeholders may object to snowmobile use occurring within Kluane NP&R.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
	Parks Canada Guiding Principles and Operational Policies doesn't explicitly deal with snowmobile use in national parks. Section 2.2 of National Parks Policy states motorized access and circulation will not be permitted in Zone 1 (Special Preservation) or Zone 2 (Wilderness) areas of national parks. Controlled motorized access is permitted in Zone 3 (Natural Environment) areas. The vast majority of Kluane NP&R is Zone 1 and Zone 2. The Zone 2 areas are expected to become legislated wilderness areas pursuant to the *National Parks Wilderness Area Declaration Regulations* within a year of park management plan approval. *Parks Canada Management Directive 4.6.10 Oversnow Vehicles* gives additional direction on snowmobile use in national parks. It states oversnow vehicle use is a marginally compatible activity that is inappropriate on most areas of national parks due to mechanical noise that disturbs other park visitors, and impacts to fauna and flora. Parks Canada legislation does deal explicitly will snowmobile use in national parks. Section 41 of the National Parks Highway Traffic Regulations specifies: *"No person shall operate an over-snow vehicle in a park unless he has the written permission of the superintendent; the over-snow vehicle is licensed, registered and equipped as required by the laws of the province in which the park is situated; he operates it in accordance with such conditions and in such areas as the superintendent may specify.....*" The environmental impacts of these events will be assessed prior to Parks Canada deciding on a course of action. The Parks Canada document *Generic Assessment of Over Snow Vehicles in Canadian National Parks* can be used as the basis for the detailed environmental	Appropriate mitigation measures will be developed during the non-CEAA environmental assessment process.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Subject to demand, the interest of potential partners and environmental assessments, seasonal tent camps for winter use may be introduced.		Management plan does not specify facilities or types of use (day, overnight, multi-day) at seasonal tent camps.		
		Impacts of seasonal tent camps will be determined during an environmental assessment review. Results will be documented in a screening report and considered before Parks Canada decides on a course of action to approve, not approve, these activities.		
Develop guidelines for dogsled use, in cooperation with guides.	⇩	Untethered dogs may chase or harass ungulates and other wildlife.	⇧	Traditional winter activity in northern latitudes.
	⇩	Camping impacts such as waste water disposal, solid waste, and human waste disposal, dog feces, fuel spills	⇧	Positive economic opportunity for dogsled guides.
	⇩	Giardia cysts in canine fecal material can contaminate the environment, surface waters, and infect other animals or people.	⇩	Conflicts with other users such as skiers where both activities occur.
	⇩	Tethered dogs may girdle and kill trees.	⇩	Mushers may encounter breakdowns, avalanches, thin ice or other natural conditions in remote location which necessitate rescue from Parks Canada staff. Rescue operations can be hazardous and financially costly for Parks Canada staff and managers.
			⇩	Spread of infectious diseases such as Giardia from dogs to humans.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects	Socio - Economic Effects
	Wilderness Use Guidelines for Dog Sledding in Kluane National Park outlines mandatory requirements that must be met by sled teams wishing to visit the park. Persons or companies intending to operate dogsled businesses in Kluane NP&R will be required to apply for an receive a business licence authorised by the Superintendent prior to undertaking these activities. Issuance of a licence triggers the CEAA (Section 13.1 Inclusion List Regulations). An environmental assessment of these activities must be conducted and the results documented in a screening report. The impacts of proposed activities and appropriate mitigation measures will be detailed at that time. The Kluane NP&R website suggests tethering dogs a minimum of 100 metres from any water body.	Dog sledding is not permitted on groomed cross-country ski trails. Potential exists for conflicts between backcountry ski tourers and mushers while on the trail or when camping at the same place and time. Dogs frequently leave scat on the trail which most skiers find offensive. Before dogs are permitted to enter the park, mushers must show proof their team has up to date vaccinations and is in good health.
6.8.10 Air Access		
Day use aircraft landings outside the Icefields will not be permitted.	⇧ This restriction will positively effect ecological integrity within Kluane NP&R.	⇧ Greater opportunity to experience solitude in backcountry wilderness areas outside of the Icefields. ⇩ Lost opportunity cost for aircraft companies to provide day use service outside of the Icefields. ⇩ Lost opportunity for persons lacking the skills, desire or mobility to visit theses areas of the park under their own power.
	No mitigation needed.	No mitigation needed.
Parks Canada will work in collaboration with aircraft operators to develop an aircraft operator code of ethics that aims to protect Kluane's ecological integrity and visitor experiences.	⇧ Reduced potential for wildlife harassment from aircraft flights. ⇧ Improved level of environmental management in aircraft operations.	⇧ Quality visitor experiences for those seeking wilderness and solitude are maintained.

6.8 Defining the Recreational Visitor Experience - Area Concepts

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
		Environmental management considerations are in place to minimize the direct impacts of aircraft operations on Kluane NP&R. All fueling is to be completed outside of the park except for operational purposes. Park fuel caches are located in the Icefields or adjacent to the highway to minimize impacts to sensitive resource such as the green belt zones.		No mitigation needed.
6.8.11 Visitor Use and Impact Monitoring				
Continue visitor use and impact monitoring and research on the current five year repetitive cycle program.	⇔	No direct impacts anticipated. Impact monitoring will identify status and trend of visitor use levels, visitor use impacts, and resource condition. Monitoring results can be used to refine management approaches.		
	⇧	Use of monitoring data has potential to avoid significant resource impairment.	⇧	Use of monitoring data has potential to enable continued visitor satisfaction.
		Existing visitor use management techniques in Kluane NP&R use an Adaptive Management approach. Results to date indicate success. Continued refinement and use of these tools is recommended.		No mitigation needed.

6.10 Public Safety and Law Enforcement

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Increase the effectiveness of the park's public safety and law enforcement programs by providing appropriate messages to park users at: trailheads; park information publications and visitor reception centres.	⇔	No direct impacts anticipated. Information displays at trailheads and other locations may need to be altered to incorporate public safety and law enforcement message content. Scope of work is likely to be restricted to replacement of message boards. Impacts of this type of work are predicable, well known and easily mitigated.	⇧	Increased public awareness of risks, hazards, necessary skills, and appropriate conduct while visiting Kluane NP&R. Increased compliant behaviour may result.
				No mitigation needed.
Maintain current Public Safety and Law Enforcement Plans.	⇔	No direct impacts anticipated. Status Quo.	⇔	No direct impacts anticipated. Status Quo.
		No mitigation needed.		No mitigation needed.
Improve warden skills in public safety and law enforcement and increase their presence within the park.	⇧	Increased ability to detect and stop illegal activities that may damage cultural or natural resources in Kluane NP&R.	⇧	Greater public safety through increased warden knowledge of Kluane NP&R, elevated levels of warden presence to detect incidents requiring action, and better skill levels and competence when undertaking warden duties.
			⇧	Increased opportunity to communicate information on Parks Canada mandate and appropriate low impact behaviour to park visitors.
			⇧	Increased knowledge, professionalism, morale and esprit de corps within the warden service.
		No mitigation needed.		No mitigation needed.
Work with neighbouring agencies and governments such as Wrangell-St. Elias National Park and Preserve, Glacier Bay National Park, Tatshenshini-Alsek Park, YTG – Parks, Champagne and Ahishik First Nations and the Kluane First Nation on law enforcement and public safety programs.	⇔	Status Quo. No direct impacts anticipated.	⇧	Provides opportunity for cooperative exchange of training, management programs, and opportunities for joint training and missions. Enhanced working relationships, and effective resource mobilization during critical incidents are expected outcomes.
		No mitigation needed.		No mitigation needed.

7.1 International and National Cooperation

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Use this plan as the management plan for Kluane National Park & Reserve as a World Heritage Site.		Impacts of specific management plan key actions are provided throughout this table and document.		Impacts of specific management plan key actions are provided throughout this table and document.
		Mitigation measures for specific management plan key actions are provided throughout this table and document.		Mitigation measures for specific management plan key actions are provided throughout this table and document.
Use this plan and the Alsek River Management Guidelines as the management plan for the Alsek River as a Canadian Heritage River.	⇔	Status Quo. No direct impacts anticipated.	⇔	Status Quo. No direct impacts anticipated.
		This approach is consistent with Park Canada policy. Section 2.2 of Parks Canada Canadian Heritage Rivers System Policy states: *"Management plans for national parks or other areas under Parks Canada jurisdiction in which designated Canadian Heritage Rivers are located will be prepared according to the National Parks Policy. These plans will contain specific reference to the management of these rivers according to CHRS objectives, and will be lodged with the Board to fulfill the requirements for designation of rivers to the CHRS."* A copy of the *Kluane National Park and Reserve of Canada Management Plan* should be lodged with the Board.		No mitigation needed.
Continue to establish and implement management strategies, including the Alsek River Management Guidelines, which protect the natural, cultural and recreational values of the Alsek River (see section on Alsek and Dezadeash Valleys and section on Zone I areas).	⇧	Integrity of Alsek River natural and cultural resources is maintained.	⇧	Recreational values of the Alsek River are maintained.
		No mitigation needed.		No mitigation needed.

7.1 International and National Cooperation

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action		Environmental Effects		Socio - Economic Effects
Ensure that the water quality of the Alsek River exceeds federal water quality guidelines.	⇔	No direct impacts anticipated. This is a monitoring objective. Status Quo.	⇧	Public health and safety is maintained.
	⇧	Water quality is preserved	⇧	Downstream uses of Alsek River water are not compromised
		Develop contingency plans for instances where the federal water quality guidelines are regularly exceeded. Heed the advice given in the Preface of the Canadian Water Quality Guidelines, "these guidelines do not constitute values for uniform national water quality and their use will require consideration of local conditions."		No mitigation needed.
Increase awareness of the natural, cultural and recreational values of the Alsek River.	⇧	Increased awareness may foster more respectful behaviour that minimises impacts to cultural and natural resources.	⇧	Increased knowledge and understanding will likely enhance visitor experience and enjoyment of the Alsek River.
		No mitigation needed.		No mitigation needed.

7.2 Public Involvement

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Report to the public on the implementation of the park management plan, including an annual report by Parks Canada and a public forum coordinated by the Kluane National Park Management Board.	⇔	No direct impacts anticipated.	⇧	Greater transparency in management of Kluane NP&R is likely to engender increased trust, collaboration and support for Kluane NP&R.
		No mitigation needed.		No mitigation needed.
Consult with the public on major initiatives that arise.	⇔	No direct impacts anticipated.	⇧	Greater transparency in management of Kluane NP&R is likely to engender increased trust, collaboration and support for Kluane NP&R.
		No mitigation needed.		No mitigation needed.

8.1 Environmental Stewardship

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Implement an environmental management system for the park with emphasis on green procurement.	⇧	Improved management of Parks Canada activities, assets, and wastes is likely to result. Net environmental effect is positive.	⇧	Material supply and contract service opportunities may result for local and regional companies or individuals.
	⇧	Reduced resource consumption and improved waste management are anticipated.	⇧	Parks Canada is likely to realize cost savings if increased resource utilization efficiencies occur.
			⇧	Parks Canada inputs to local waste management streams will be reduced. Extended operating life for waste management facilities with finite lifespans (e.g. landfill sites).
		Parks Canada National EMS Plan (14 Environmental Aspects) should form basis of Kluane NP&R EMS. Parks Canada has set objectives and targets for all environmental aspects. Development and use of an EMS is consist with the policies of Parks Canada and the federal government.		No mitigation needed
Demonstrate environmental leadership by communicating the park's environmental performance to stakeholders and the people of Canada.	⇔	No direct impacts anticipated.	⇧	Greater public awareness of Parks Canada environmental performance
	⇧	Increased public knowledge of environmental stewardship may result in behavioral changes that benefit the environment.		
		No mitigation needed.		No mitigation needed.
Work with visitors, tenants, service providers, adjacent land owners and other stakeholders to encourage them to manage their operations to high environmental standards.	⇧	Improved management of activities, assets, and wastes is likely to result. Net environmental effect is positive	⇧	Material supply and contract service opportunities for local and regional businesses may result.
		No mitigation needed.		No mitigation needed.
Inform park users so they can make environmentally responsible choices.	⇔	No direct impacts anticipated.	⇧	Some park users will feel sense of satisfaction behaving in environmentally responsible manner.
	⇧	Environmentally responsible choices by park users should lessen their impacts on the greater Kluane ecosystem.		
		No mitigation needed.		No mitigation needed.

8.2 Operations

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Use the new, 5 year State of the Park Report and Parks Canada's national biennial State of Protected Heritage Areas Report to report on the state of the park's ecological integrity.	⇔	No direct impacts anticipated.	⇧	improved understanding of role of Kluane NP&R in local and regional economy.
	⇧	Knowledge of the state of Kluane NP&R is likely to increase. Improved understanding of local and regional threats and issues may increase levels of regional cooperation and improve management of greater Kluane ecosystem.		
		No mitigation needed.		No mitigation needed.
Utilize the *Canadian Environmental Assessment Act* and the Yukon Development Assessment Process (DAP), when it comes into effect, to assess the environmental impacts of projects before they are undertaken.	⇔	Status Quo.	⇔	Status Quo.
	⇧	Environmental effects of proposed projects and activities will be assessed. Environmental assessment results will used by Responsible managers when deciding on a course of action (approve; not approve; refer to mediation or panel review). Projects and activities with significant adverse environmental effects will be avoided. Projects with minor environmental effects will be designed and executed to avoid or mitigate impacts.	⇧	Public will be provided with access to a list of projects in Kluane NP&R currently undergoing EA review. Public will be given an opportunity to review and comment on controversial projects or those with considerable potential to generate environmental effects.
		Parks Canada guidance materials should be consulted to ensure compliance with EA policy and legislation. Key references include: *Procedures of the Department of Canadian Heritage for Complying With the Canadian Environmental Assessment Act* and *Management Directive 2.4.2 Impact Assessment*.		No mitigation needed.

8.2 Operations

⇧ positive effect ⇔ neutral effect ⇩ negative effect Mitigation / Recommendation

Key Action	Environmental Effects		Socio - Economic Effects	
Review the current park operations facilities and infrastructure, including staff housing and warden cabins to ensure that the facilities meet the long-term needs of park operations and administration.	⇔	No impacts anticipated from the review. Impacts will depend on outcome of review. Facility renovation, decommissioning and removal, or new facility construction may be needed.		Difficult to predict prior to review completion.
			⇧	Positive economic opportunity for architects, planners, construction contractors, and material suppliers if changes to infrastructure are proposed.
		If infrastructure changes are needed, the impacts of these undertakings need to be assessed pursuant to the CEAA or successor legislation. Impacts of construction, renovation and decommissioning are well known and mitigable with known technology.		No direct impacts anticipated..
Continue to acquire private cottage holdings on Kathleen Lake as they become available.	⇧	Acquisition of private land holdings will allow Parks Canada greater control over these sites. Sources of anthropogenic disturbance will be reduced. Facility decommissioning and site rehabilitation become a viable option.	⇩	Cottage owners may be reluctant to relinquish exclusive access rights to these sites.
			⇧	These sites will be equally accessible to all Canadians and Kluane NP&R visitors.
			⇧	Improved visitor experience for those seeking a natural setting with few or no human made facilities present.
		Standard site remediation and restoration techniques should be employed.		No mitigation needed.