

Kluane National Park

A perspective from
the National and
Provincial Parks
Association of Canada



KLUANE NATIONAL PARK

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"I am the land that listens, I am the land that broods;
Steeped in eternal beauty, crystalline waters and woods."

From "The Law of the Yukon".
by Robert Service



Slims River Valley (Photo by Deirdre E. Griffiths)

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Front Cover Photo Manfred Hoefs
Back Cover Photo Dalton Muir

PREFACE

The Federal Government announcement of February 22, 1972 of the intent to establish an 8,500-square-mile National Park in the Kluane area, Yukon Territory, was greeted by many Canadians with great pleasure. However, some observers saw little value in the setting aside of Kluane and two other northern parks, at Nahanni and on Baffin Island, viewing them as remote places of relatively little use to the growing and essentially urban population concentrated in southern Canada. Such views are surely as short-sighted today as they were in the 1950's when federal authorities expressed reservations about transferring certain National Park Reserves on western Vancouver Island to National Park status because they were isolated and the water was too cold. Today only about fifteen years later, tens of thousands of tourists are streaming to the new Pacific Rim National Park and their numbers and impact on Long Beach are great enough to cause concern about

vegetation damage, disturbance of birds and other wildlife, and loss of the special quality of this outstanding western shore.

John Theberge began preparing this report on Kluane many months ago when NPPAC and other organizations were pressing for the designation of the area as a National Park, its special qualities having been identified as early as 1942, when about 10,000 square miles were set aside as park reserve. Just as the report was nearing completion, the Government made its decision to establish the present Park. At our request, John Theberge then undertook a re-writing of the report, emphasizing information considered to be significant for the zoning, recreational use and management of a National Park. He also has critically evaluated the size and boundaries of the Park, paying particular attention to values foregone by the failure to include certain areas of the original 10,000-square-mile park reserve. His

discussion of these "losses" is worthy of serious consideration by the public and by those government officials in a position to modify the boundaries, or provide alternative means of environmental protection through game sanctuary or other land-use status.

Theberge's report is of additional value in that it briefly considers the conflict between mining potential and the possible use of an area as a National Park. It took thirty years for this conflict to be resolved in Kluane, at least in its present form, and both the mineral and the park people are still in disagreement over the boundaries. Theberge presents his analysis of the values of the area for minerals and parks purposes and comes out strongly in favour of the latter. In his detailed discussion of the qualities of the park he strengthens his case. The representative elements of Kluane are discussed; it contains ecosystems or landscapes typical of much of the surrounding country, which can now be preserved in

the wild state for the recreational and educational use of the people. Theberge also presents a valuable, detailed description of some of the unique features of the Park: northern pockets of grassland normally found much farther south; unusually rich grizzly bear habitat; areas containing large numbers of birds of many kinds; and unusual peaks such as Mt. Logan, which towers more than 19,000 ft. above sea level.

All who read this report will have a much greater appreciation of what Canada has gained in Kluane and may support some of Dr. Theberge's ideas to include habitats and landscapes that the National and Provincial Parks Association of Canada thinks were unfortunately omitted from this promising new northern park.

J.G. Nelson,
President



Kaskawulsh Glacier (Photo by Dalton Muir)

INTRODUCTION

On February 22, 1972, the Hon. Jean Chretien, Minister of Indian Affairs and Northern Development, announced his government's intention to create Kluane National Park in the south-east corner of the Yukon. The Park, to cover 8,500 square miles, contains "Canada's highest mountains, most spectacular icefields and some of North America's finest wildlife populations (1)." This culminated efforts to establish a park at Kluane beginning in 1942 (2).

Kluane National Park will become a legal entity when its establishment is passed by Parliament as an amendment to the National Parks Act. The land involved has been withdrawn from disposal and transferred to the administration and control of the National and Historic Parks Branch, by Order-in-Council (3). While this action has received considerable acclaim, public debate still centres on the boundaries of the new park.

The purposes of this report are:

1. to make clear the gains and losses resulting from the present boundaries of Kluane National Park,
2. to document the ways in which land at Kluane was managed in the years preceding park status, thus helping to develop more effective approaches in the establishment of new parks.
3. to make Canadians better acquainted with the spectacular scenery, natural diversity, opportunities for outdoor recreation ranging from roadside camping to wilderness back-packing and the chances to see and photograph northern mammals in a sub-arctic environment, all of which are part of Kluane National Park.

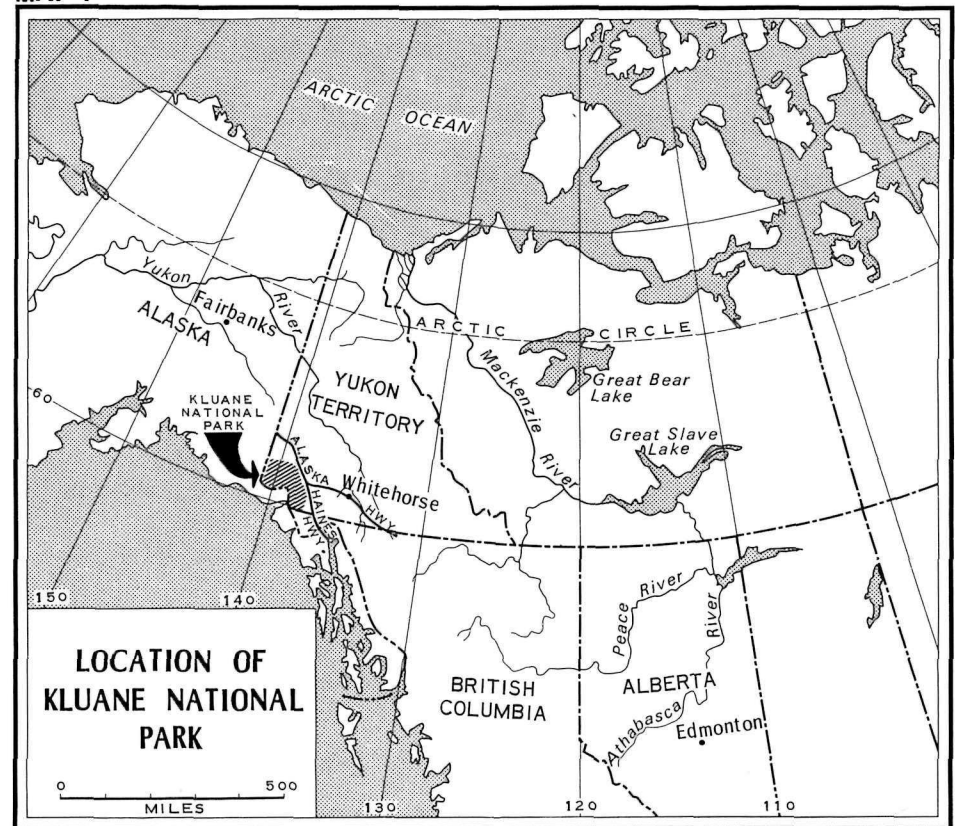
Kluane National Park includes spectacular mountain scenery which is remote yet accessible via the Alaska Highway (Map 1). Here are wide valleys, open slopes - many above timberline, dense populations of big game,

mountain lakes, valley glaciers, the largest icefield in the world outside polar regions, the highest mountain range in North America, Canada's highest mountain - Mount Logan. Kluane has a summer climate with shirt-sleeve temperatures at valley floor elevations, and annual precipitation of less than 13 inches per year on its accessible east flank.

In April 1971, the National and Provincial Parks Association of Canada, a citizen conservation organization dedicated to park ideals, asked the author to assess the park values at Kluane. The facts presented here are the result of a month at Kluane devoted exclusively to conducting an ecological appraisal (June, 1971) plus the accumulation of previous experience at Kluane and the assessment of all relevant published data, collected over a period of three years up to the present. Assisting in the appraisal were two local biologists, M. Hoefs and D. Mossop, both of the Department of Zoology, University of British

Columbia. Other authorities representing government, university and the mining industry added their viewpoints and expertise.

MAP 1



This is the only comprehensive study of the Kluane area to be made public which relates its values as a national park to other types of resource uses. It includes an assessment of mineral occurrences and the economic benefits of mining, and relates these to natural features worthy of preservation and the economic benefits of a large national park. It develops a rationale for park boundaries based on ecological criteria which are pertinent to national park purposes.

"Kluane region," for purposes of this report, includes the 10,130-square-mile Kluane Game Sanctuary within which Kluane National Park lies, plus an eastward extension following the ridge and mountain tops adjacent to the east side of Kluane Lake, a total of approximately 10,700 square miles (Map 2).

Past and Present Status of Kluane

In 1942, the Federal Government reserved "for

national park purposes", approximately 10,000 square miles in the south-west corner of the Yukon, by Privy Council Order 11142. The following year, Kluane Game Sanctuary (10,130 square miles) was established (5). The park reserve remained within the Sanctuary, but in 1944, Privy Council Order 930 allowed prospecting, claim staking, and the granting of mineral rights within the reserve area (6).

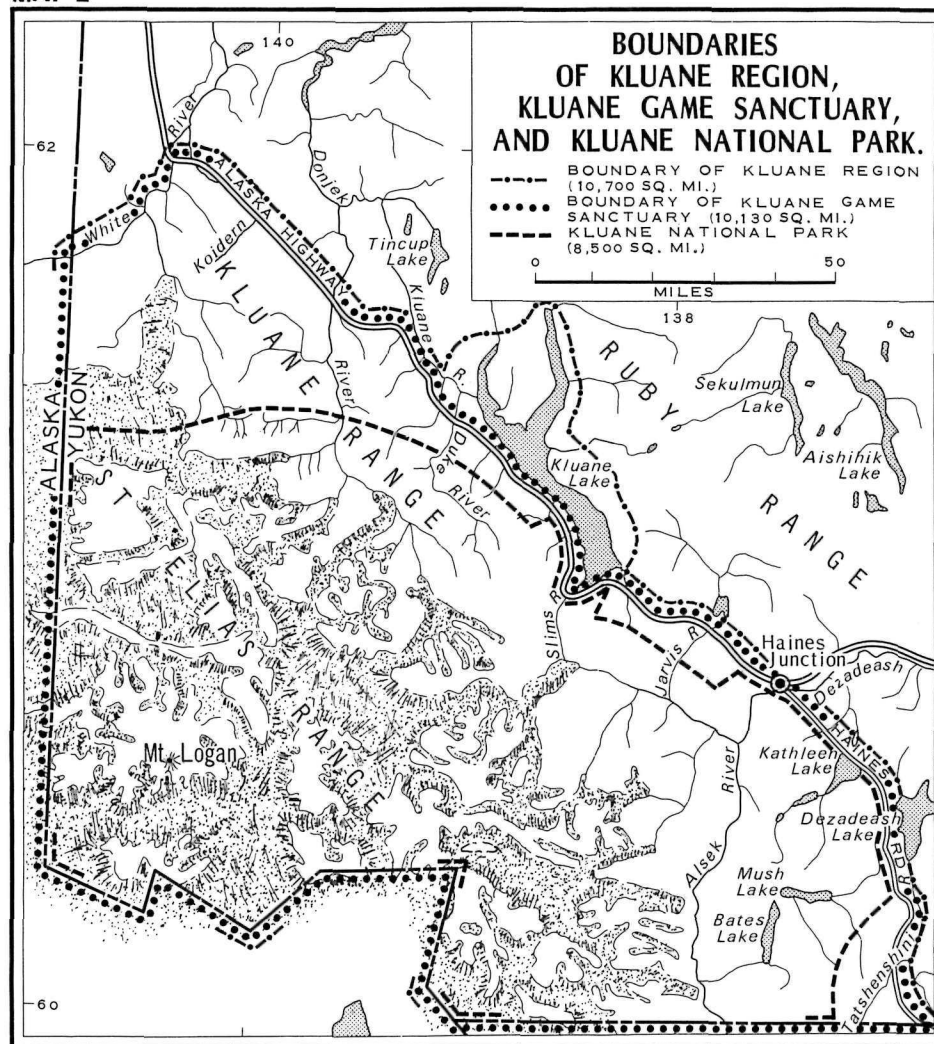
Legally, "reserved for national park purposes" meant nothing, as no land-use restrictions existed for this category. "Sanctuary" status meant that hunting and trapping were prohibited. That constituted the sole protection for scenic and wildlife resources recognized to be of national significance. No regulations exist for Canada's Game Sanctuaries to prevent the destruction of wildlife habitat, a rather serious flaw, as far more species of wildlife in North America are threatened by habitat destruction than by overharvesting.

The threat of possible unregulated mining activity

in a proposed park area, then, has been one facet of the problem at Kluane. Two steps might have circumvented this: 1) quicker establishment of the park after reserve status was declared, 2) withdrawal of staking, or regulation of mining activities in the reserve area. The latter was not possible in the absence of land-use regulations. Regulations on land-use in the Yukon required amendments to three existing pieces of legislation - the Territorial Lands Act, the Yukon Placer Mining Act, and the Yukon Quartz Mining Act. The first two Acts were so amended in 1970. The third Act is presently being completely overhauled as the new Yukon Minerals Act (Bill C-187) and will include an amendment with similar intent to allow land-use regulations to be made. Section 94 of this proposed Act reads:

"Whenever in the opinion of the Governor in Council any land in the Territory is required for a ...National Park ...he may by order prohibit entry on such land for the purpose of prospecting for minerals or claim thereon..."

MAP 2



At Kluane, park interests and mineral interests were in apparent conflict. In 1969, Mr. J. Gordon, Assistant Deputy Minister of Indian Affairs and Northern Development, offered the "core principle" as a compromise to "solve the dilemma of establishing a National Park and yet permit exploration and exploitation of valuable minerals and other natural resources (7)". The "core principle" as it pertained to Kluane, was explained in a letter to the author from Mr. Chretien in May, 1969:

"the core will immediately receive full status as a national park, while the surrounding reserve area will allow mining activity under adequate controls for a stated period of time. These reserve lands will in time be added as park lands to the existing core area. In this manner, both mining and park interests will be served."

The "core principle" found little support. Mining interests felt reluctant to spend money on exploration in an area that might become a park after a stated period of time. Park advocates questioned

the inclusion of "second-hand" landscapes into national parks.

Nevertheless, the core principle died slowly. As late as August 8, 1971, James Smith, Commissioner of the Yukon Territory, was quoted in the New York Times as saying, "the present plan calls for a park of about 700 square miles (8)". In the same article, however, Mr. J. I. Nicol, Director of the National and Historic Parks Branch, stated that "he had no idea how large a park he would formally recommend."

The "core principle" had been "set aside" by November 1971, as stated by Mr. Chretien in a letter to Dr. J.G. Nelson, President of the National and Provincial Parks Association of Canada.

Kluane National Park, as declared in February 1972, lies within the Kluane Game Sanctuary (Map 2). The boundaries exclude areas of possible mineral significance, and make clear that the Federal Government has attempted a compromise between park values and mineral values. The

validity of this compromise can be better judged in the following pages.

The Kluane Game Sanctuary remains around the new Park, with its restrictions on hunting. This status is viewed as a necessary adjunct to the Park by the Federal Government (9). However, three facts jeopardize the Kluane Game Sanctuary:

1. The Sanctuary is a Territorial, not a Federal Government entity, which places its continued existence outside the full control of the Federal Government.
2. The rights of native people to hunt in Game Sanctuaries in the Yukon is the subject of a current legal dispute.
3. Wildlife habitat may be jeopardized by continued lack of controls over mining activity in the Sanctuary. Until the Yukon Minerals Act replaces the Yukon Quartz Mining Act, land-use regulations currently in effect do not apply to the mining industry.

The Yukon Chamber of Mines, which has opposed any large park at Kluane, has officially proposed boundary changes to the Federal Government, which would free for exploitation areas of possible mineral significance within the Park, while at the same time reducing the limited amount of parkland which is easily accessible from the Haines and Alaska Highways. This proposal is currently under review by the Department of Indian Affairs and Northern Development.

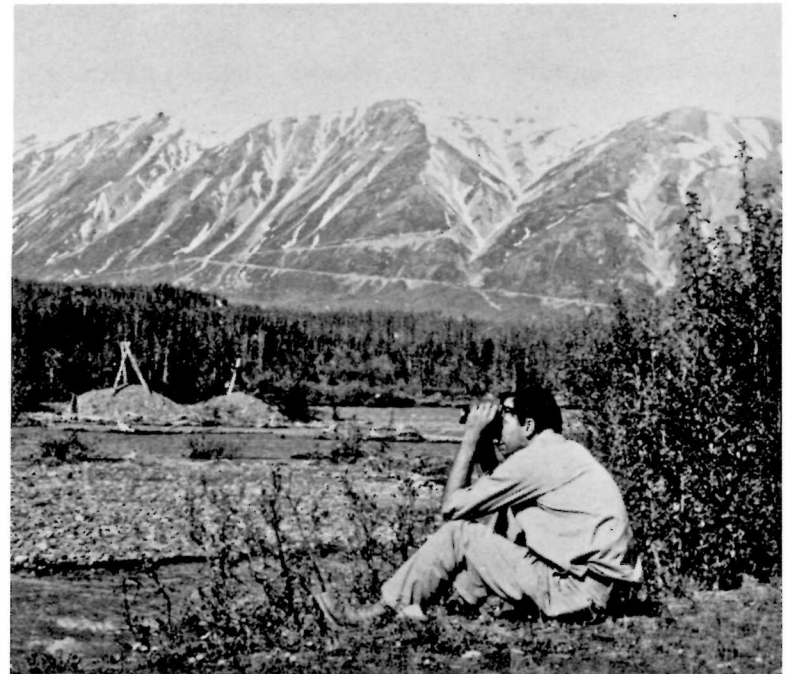
RESOURCE-USE CONFLICT

The validity of the Federal Government's boundaries must be viewed with full knowledge of the potential values of both a park and minerals at Kluane.

Assessment of the value of resources has traditionally been based upon monetary criteria. If sufficient financial returns can be generated to the developer from resource use, then development usually proceeds. Only recently are we beginning to assess all the social costs and social benefits of alternative forms of development, and include environmental and aesthetic criteria in decisions on land-use. Relevant to this is Prime Minister Trudeau's speech on May 1, 1971 in Vancouver:

"we have been deluding ourselves for a quarter of a century with a misleading bookkeeping system that permits industry, government, agriculture every segment of the community - to pass on certain costs to society at large. No business man would calculate his net gain without first taking into account the deterioration

of his plant building, the depreciation of his machinery, and the depletion of his stock of raw materials. Why then do western governments continue to worship at the temple of Gross National Product? Isn't it time we paid heed to resource exhaustion, to environmental deterioration, to the social costs of over-crowding, to the extent of solid waste disposal? Shouldn't we, in short, be replacing our reliance on Gross National Product with a much more revealing figure - a new statistic which might be called Net Social Benefit (10)?"



Mountain-side mining road of Jackpot Copper Company in the Tatshenshini River valley.

As a basis for detailed special studies of resource use in Canada, the Science Council of Canada recently formulated a set of national objectives (11). Commenting on the first objective, "national prosperity", the special study dealing with Fisheries and Wildlife Resources (12) stated:

"This goal...should be qualified so that it is clearly understood to mean national prosperity over the long term and to include environmental considerations and tangible aesthetic values as well as Gross National Product."

How do we measure environmental and aesthetic values such as those associated with a park, to allow a comparison with the economic information from an extractive resource like mining? Posing a similar question, Aldo Leopold wrote A Sand County Almanac (13):

"If wild birds and animals are a social asset, how much of an asset are they?...what is a wild goose worth?... My notes tell me I have seen a thousand geese this fall. Every one of these in the course of their epic journey from the Arctic to the Gulf has on one occasion or another probably served man in some equivalent of paid entertainment."

Pimlott et al. (14), faced with a similar question regarding the recreational values of fish and wildlife for the Science Council, stated:

"In the final analysis, the value of anything to human society is simply a matter of human opinion. This opinion can seldom be expressed clearly, for there is no clear way to evaluate such things."

Despite these difficulties, some approaches are being made towards solution of the problem. L. Leopold has devised a method of measuring scenery on the basis of uniqueness (15). McHarg (16), Dorney (17), and others have shown that it is possible by considering soil, vegetation and other ecological factors to assess the value of land for various uses.

In this report, rather than adopting these approaches, the intangible park values are assessed in terms of criteria established by the National and Historic Parks Branch. While this does not provide direct comparisons with monetary values of mining, such an approach does judge the worth of Kluane in the light of recognized

values for national parks. In addition, social (monetary and environmental) costs and benefits of both a large park and of mining are discussed.

Kluane's Resources

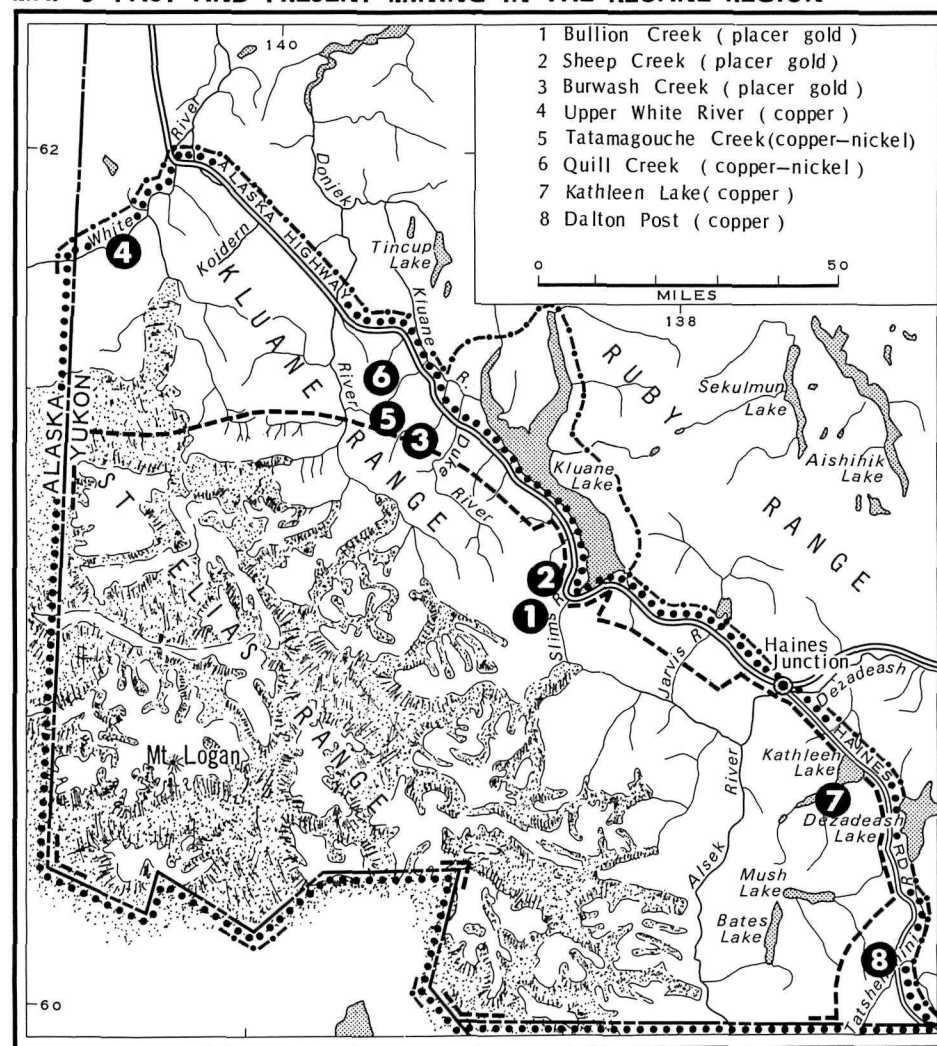
Two important resources exist at Kluane: one is a combination of spectacular scenery, dense wildlife populations, and a variety of unique natural features. The other is deposits of copper, nickel, gold and a few trace minerals. Of lesser importance are fish and timber. Lakes are few, but those that exist abound with trout and arctic grayling. Timber is small and slow to regenerate in this northern climate.

Mining

The first miners to enter the Kluane region were en route to Dawson via the Chilkat Pass in 1898. Gold was discovered in the area in 1903, when four miners staked claims on Bullion and Sheep Creeks (Map 3, Symbols 1 and 2) (18). Burwash Creek (Symbol 3) was staked a year later. Today, all active placer gold

mining is on these creeks.

MAP 3 PAST AND PRESENT MINING IN THE KLUANE REGION



Native copper was known in the region before white men arrived. It was actively traded by the Indians and used for axe heads, arrowheads, knives, cooking utensils (19). Copper deposits were first staked on the upper White River (Symbol 4) in 1905. By 1908 many claims had been staked on the ridges adjacent to Tatamagouche Creek (Symbol 5) and Quill Creek (Symbol 6) (20). Many of these claims are now owned by Hudson's Bay Mining and Development Company and Imperial Oil Limited.

Further copper deposits are known at Kathleen Lake (Symbol 7) and Dalton Post (Symbol 8).

While gold and copper have been mined, and nickel will be mined, no other minerals have been exploited, despite knowledge of their existence. Coal, asbestos, gypsum, molybdenite, wolframite and fluorite all exist in commercially insignificant quantities (21).

Social benefits of mining - Muller (22)
assembled data and estimated the extent of past total

gold production on creeks in the Kluane region from discovery until 1960. Using his figures, and an estimated average value of \$20 per ounce prior to 1934, and the internationally fixed price of \$35 per ounce thereafter, the principal creeks (Sheep, Bullion, Burwash) have produced slightly in excess of \$704,425.

This estimate, although approximate, has been prepared from best available sources, and indicates an order of magnitude of less than one million dollars in total. In light of annual mineral production from all sources in the Yukon from 1959 to 1968 of between 12 and 16 million dollars (23) Kluane's total gold production has been insignificant. In 1970 and 1971 only two small outfits of four or five men each operated on Burwash Creek and a one or two-man outfit on Bullion and Sheep Creeks. Their activities were not worthy of mention in the 1970 federal assessment of mines and mining in the Yukon (24). In economic terms, therefore,

gold mining at Kluane is still of little consequence to either the Yukon or Canada, and inclusion of Bullion and Sheep Creeks within Kluane National Park, as intended by the Federal Government, represents no significant mineral loss. The Yukon Chamber of Mines, however, has proposed exclusion of these creeks, as well as Sheep Mountain rising to their immediate north, a feature of considerable significance in the Park.

Gold mining provides a living for about ten men in the Kluane area. While this is important to the individuals involved, it is not significant, even on a local scale, in terms of the total labour force. The Yukon provides abundant opportunity for these men to work elsewhere. For example, the Dawson and Mayo mining districts support considerably more placer gold mining than does Kluane. In the whole Yukon, during the peak employment season, about 100 men work at placer gold operations (25). Therefore, placer gold mining is not a large source of employment.

Copper and nickel were not mined in the Kluane region in 1971. However, in the past a few small operations existed. Largest of these was Johobo Mines (Map 3, Symbol 7) which shipped 2,000 tons of copper ore out of the Sanctuary in the early 1960's. The exact value of this is not known, but has been estimated from tonnage figures. Assuming the ore assayed at approximately two per cent copper, and using copper prices prevailing in the early 1960's of approximately \$600 per ton, Johobo's total operation grossed about \$24,000. This was insignificant in relation to the Yukon's total annual production in those years of 12 to 16 million dollars. Johobo's operation has now closed down. This area is included within the Park. The Yukon Chamber of Mines has proposed its exclusion, along with its access route along the south shore of Kathleen Lake, whose park value will be discussed.

The largest mining venture in the Kluane area is based on copper-nickel deposits being developed by

Hudson's Bay Mining and Development (Hudson-Yukon Mines Limited) at Quill Creek located north of the present park boundaries (Symbol 6). A concentrator has been constructed beside the Alaska Highway in the Sanctuary. Production was scheduled to begin early in 1972 but did not start until June. One month later, in July,



Ore concentrator at Quill Creek, owned by Hudson's Bay Mining and Development Company



Quill Creek re-made

the Company announced that it would close the mine in six months' time for economic reasons. Now, once again, there is no operating mine in the Kluane region.

Published ore reserves at Quill Creek are 738 thousand tons which, mined at the proposed rate of 600 tons per day, would have given the mine a life of only

five years. Total employment when in full operation was estimated at 180 men. The Company had been looking forward to grossing approximately $12\frac{1}{2}$ million dollars a year before deducting operational expenses. Had the mine proved viable, it would have increased the Yukon's total mineral production of \$79,642,350 (30) by approximately 14%. In relation to Canada's mineral production of almost \$5.8 billion (31) it would have added about 0.002% to the total.

Turning to exploration, both individuals and small and large companies have explored in the Kluane region, resulting in widespread staking of claims. With the exception of those operations already mentioned, most of these claims are inactive. Imperial Oil Limited conducted diamond drilling exploration on Tatamagouche Creek (Symbol 5) in 1970, but was inactive in 1971. Jackpot Copper (Symbol 8) is carrying out a small

exploratory drilling programme on their claims near Dalton Post. Although these exploratory ventures near Dalton Post have resulted in no published ore reserves, this area, in the extreme south-east corner of Kluane (Map 3) was excluded from the Park. The historic and ecological significance of the Dalton Post area will be discussed.

Most of the remaining claims have been held in speculation, under provisions in the Yukon Quartz Mining Act by which payment of \$100 per year per claim may replace actual work on the claim. Under the proposed Yukon Minerals Act, payment in lieu of work will not be accepted, but the excess value of work done in one year can apply to later years.

This exploratory activity at Kluane is not unusually intense; it goes on all through the Yukon and much of the Northwest Territories. In terms of employment, it results in only a small number of jobs.

Social costs of mining - Mining exploits non-renewable resources; when the mineral has been extracted it is there no more. We have not assessed total supply and demand with the view of pacing our requirements, curtailing growth if necessary, or establishing priorities for use of certain minerals. This is



Hudson's Bay Mining and Development Company, operating at Quill Creek (Note erosion gully from vehicle on the left slope.

because most major minerals which we exploit are present in supplies that seem inexhaustible. However, we are becoming concerned over our oil resources, and clearly see the need to assess more fully supply and demand. Perhaps this concern will soon extend to copper, nickel, gold and other minerals. Until it does, we cannot estimate the long-term good of exploiting all economically-exploitable mineral reserves, as is our practice.

A more tangible social cost is the scars left by mining. Placer gold operations leave tailing piles where there were once streams and riparian vegetation. The use of water to extract gold leaves these tailing piles devoid of organic matter; plant succession is painfully slow. This is the legacy the one million dollars of gold production has left in Burwash, Sheep and Bullion Creeks. Even the preparations for mining can be destructive. Vehicles driven across tundra leave tracks that often remain for decades, resulting

in permanent erosion gullies. Much of Kluane is upland tundra, susceptible to such damage. In 1970 a mine road built across the Tatchenshini River blocked a salmon run. Garbage, which the author observed uncovered at Hudson-Yukon's operation, violates Section 20 of "Commissioner's Order 1961 - 38, Public Health Ordinance".

A more subtle but associated social cost of mining is wilderness destruction. True wilderness is defined as tracts of land lacking man-made alterations. Build a road on a visible mountain-side and true wilderness is gone. The mountain-side road of Jackpot Copper, visible from the Haines Highway, destroys the wilderness character of a whole valley.

In terms of the total area of Kluane, wilderness destruction by mining so far is slight. However, in this mountainous area, both human use for wilderness recreation and mining activity are concentrated in the valleys. Of the 10 major valleys in the Kluane region,



Hudson's Bay Mining and Development Company's method of garbage disposal.

2 have had recent mining activity, and one has an active exploratory operation. Past exploration has occurred in all. Considering this, we have already paid a moderate

social cost in terms of wilderness loss in the valleys.

The destruction of wildlife is another possible social cost of mining. Mines bring people, many who wish to hunt. Game laws must be made, continually updated and enforced. The Yukon Game Branch, responsible for wildlife management in the Yukon, prior to September 1972, employed no professional biologists. However, as game has been protected in Kluane since 1943, mining here has not caused over-exploitation of wildlife. If game sanctuary status were removed adjacent to the new park, adequate protection of wildlife could become a problem. Of potentially greater cost is wildlife habitat destruction. Riparian vegetation in river valleys is used by various species - moose, bears, wolves, coyotes.

Mining is a notorious contributor to air and water pollution. Crushing of rock creates fine particles that enter both air and water. Toxic compounds and pH adjustors, necessary for the

concentration of copper-nickel ore, present difficult problems. Domestic sewage at large mines must also be treated. If water pollution occurs at Hudson-Yukon's operation on Quill Creek, it will extend to the Kluane River and hence possibly to the upper Yukon River. The Federal Department of the Environment currently monitors Quill Creek, sending water samples to Vancouver for bio-assay tests. Legislation backs up this monitoring system - the Fisheries Act and the Northern Inlands Water Act. As well, the proposed Yukon Minerals Act reads:

Section 96 - "Where a person who is the holder of a recorded mineral claim...causes to be discharged from his claim...into the atmosphere, upon the surface or into the subsurface of any land in the Territory any substance that...is likely to be harmful to humans, animals or vegetation, the Minister may by order require that person (a) to treat that substance... so that it is not discharged in a form harmful..."

However, despite much legislation to prevent water pollution in Canada, we have a history of deteriorating water quality. Doubtless, we will be faced with accepting some level of pollution from Hudson-Yukon's operation.

Kluane Mining in Perspective - In 1970, the Yukon's total mineral output of \$79,642,350 represented 1.3% of Canada's total mineral output. Total production in the Yukon came from six mines (33).

The Kluane region lies at the west end of a "promising copper-gold belt, centered on Whitehorse and extending nearly 350 miles in an east-west direction from Wolf Lake to Beaver Creek across a 75-mile width. Nickel showings are common at the western end (34)". This description is only general, as Whitehorse itself falls just outside the delineated area. The belt, described, does not fall within Kluane National Park. It includes approximately 500 miles in the northern corner of the 10,130 square mile Kluane Sanctuary. Although almost all of the belt lies well to the east of the Sanctuary, in listing mineral showings in the belt, D.M. Carr & Associates, in their analysis of mineral occurrences in the Yukon, included minerals at Quill Creek as well. However, even if the belt

included the whole Kluane Range itself, no more than approximately 16 per cent of the belt would fall within the 10,700 square mile Kluane region. Such would represent the compromise the mining industry would face if the full region became a national park. Pertinent to such a compromise is Carr's information, recorded in map form, that significant mineral deposits exist throughout the entire Yukon.

The copper-nickel-gold in the belt is described by Carr as "promising". This assessment is based on known mineral deposits, not on actual production. Besides Hudson-Yukon's Quill Creek mine, New Imperial Mine, located nine miles from Whitehorse, has been the only producer to date in the belt. With reserves of nine and one half million tons (35) (considerably more than at Quill Creek) and a market in Japan, this mine appeared to be a significant venture. On July 1, 1971, it suspended operations due to slumping copper prices, and 160 men were laid off with seven days' notice.

Also attributable to economics was the failure of Hudson-Yukon to commence production early in 1972 as had been planned, (36) and decision to suspend operations by the end of 1972. The boom and bust phenomena of mining are well known. Carr refers to the Yukon economy as "dominated by the volatile and uneven growth of the mining industry". This fact causes people who depend on mining for their livelihood to face constant disruption in their lives.

Among problems compounding to limit operations of the mining industry in the Yukon as listed by Carr are: high costs of exploration and development in such a remote area; high capital and operating costs due to transportation; the need to compete internationally for the sale of its products for lack of a market nearby in Canada; and inadequate transportation facilities. This latter can be easily remedied, but not so the others.

Clearly, the value of Yukon mining to Canada lies in the unknown future. World markets and economic conditions will dictate the future value of Yukon minerals. Over these factors, we have little control.

National Park

Kluane is the Yukon's only national park. The values of this land for a park are obvious to anyone who has seen the area; living museums of beauty such as Kluane do not need pages of writing to document their beauty.

Social benefits of a national park - Two values at Kluane will be more fully utilized with national park status - its tourist potential and wildlife.

Regarding tourism, D.M. Carr states, "The evidence would indicate that in the long run the benefits to the permanent economy will be greater if much of the best of the Yukon's spectacular scenery is soon reserved and developed as a natural wilderness recreation area" (38). He goes on to say:



Kluane Lake. Mountains in background are in Park



Tundra above Sheep Creek

"Because the tourist industry can make a major contribution to the stability and output of the Yukon economy and because wilderness reserves will make a major contribution to the tourist industry it is recommended that early action be taken to reserve suitable areas for National Parks".

Also:

"tourism has been making a steadily increasing contribution to the growth of the Yukon economy. At this stage in the progress of wilderness in North America, the Yukon Territory may offer a haven of natural wilderness recreation that is particularly attractive to the increasing number of families who have the leisure and income to enjoy it. These three contributions of tourism to the Yukon economy - its stabilizing influence, its economic value, and its natural wilderness atmosphere - suggest that it can have an essential value in the future of the Yukon Territory and that this value will contribute substantially to the economic potential of the Yukon".

Although impossible to express in actual dollars, we can therefore realistically consider the economic benefit of a large park at Kluane to be of considerable potential significance to the Yukon.



Arctic Tern over a pond near Slims River
(Photo by Deirdre E. Griffiths)

Wildlife, one of the prime attributes of Kluane, cannot be hunted or trapped in any Canadian national park. It must be utilized in a non-consumptive way - observation, photography, interpretation of sign, and research directed towards nature appreciation. Wildlife experiences possible in Kluane are second to no other area in Canada. With large numbers of species and individuals, open valleys and low vegetation in alpine areas, opportunities to encounter wildlife are unlimited. By building a limited road system in certain designated areas, trails in other areas, and augmenting these with interpretive booklets, field guides, displays and conducted hikes, as is the Parks Branch's practice in other parks, visitors will be able to reap the full value of the wildlife resource. By using towers, blinds, and spotting scopes, one could observe Dall sheep and grizzlies on traditional ranges, waterfowl in the bog area in northern Kluane, dens of red foxes and coyote in open tundra country;

opportunities are unlimited for an imaginative park wildlife interpretive programme.

The full value of this Park will become more evident in a following section, "Ecological and Park Values at Kluane".

Social costs of a National Park - Social costs of any resource-use must be viewed in both monetary and ecological terms. Except for ecological and wilderness reserves, National Parks, when managed properly, cause less ecosystem disruption than any other land or resource use. National Parks Policy sets out criteria that serve to minimize the impact of man - "our most fundamental and important obligation in the administration of the (National Parks) Act is to preserve from impairment all significant objects and features in the parks". Litter is controlled, trails and roads are designed to reduce "impairment of the landscape", buildings must be "in harmony with the National Park", and large zones are left as wilderness. Although these ideals have not always

been lived up to, the effort to do so is at least a part of stated National Parks Policy.

The monetary costs of establishing Kluane National Park depend on how quickly park development proceeds. Land in the Yukon is Federal, so Kluane can become a national park with only the purchase of private holdings. Few areas in Canada accessible to tourists have so few existing establishments. Lodges and gasoline stations exist about every 25 miles along the Alaska and Haines Highways.

Mineral claims at Kluane must be extinguished. Under present planning these will be allowed to lapse; only those on which activities are planned which would be detrimental to the park will be negotiated (30). As most mineral claims are inactive, as discussed, costs in this area will also be slight.

The following is an estimate of a minimal capital cost of establishing the 8,500 square mile park at Kluane. Since most capital costs must be borne regardless

of the size of the park, creation of a larger park is not proportionately more expensive - in fact, initially it would cost little more:

| | |
|--|-----------------|
| - 3 park gates (Haines Highway and north and south Alaska Highway) | \$30,000 |
| - buildings or trailers for personnel (temporary if necessary) | \$75,000 |
| - 4 vehicles at \$5000 each | \$20,000 |
| - nature interpretive centre (temporary if necessary) | <u>\$75,000</u> |
| TOTAL - | \$200,000 |

Maintenance costs to be borne annually would include a minimum of:

| | |
|--|------------------|
| - 1 park administrator | \$12,000 |
| - 1 interpretive and research officer | \$12,000 |
| - 9 summer temporary employees to man gates (4 months each @ \$600 a month) | \$21,600 |
| - 9 summer temporary employees to maintain campsites, interpretive centre, build trails, enforcement | \$21,600 |
| - miscellaneous costs - gasoline, office supplies, tools, etc. | <u>\$100,000</u> |
| TOTAL - | \$167,200 |

A lesser immediate cost would involve the preparation and distribution of trail maps, information leaflets, and interpretive booklets. The National and Provincial Parks Association would be pleased to help with such material.

Three campgrounds presently exist beside the Haines and Alaska Highways, either in or adjacent to the new national park. These are maintained by the Yukon Government. Four additional campgrounds fall within the 10,700 square mile area. Initially, these will provide camping facilities in the new park, with little additional cost.

Further development of the park will add costs in the future - additional road building, reconstruction of historic features, satellite nature interpretive facilities, additional campgrounds.

National Park at Kluane in Perspective - Along with Kluane, the Minister of Indian Affairs and Northern Development established two other national

parks north of the 60th parallel - Nahanni (1,840 square miles) and Baffin Island (8,290 square miles). This increased the total area within Canadian National Parks by more than 50 per cent, to 49,800 square miles. These parks brought to 10 the number of new parks created since 1968.

In announcing the plans to establish Kluane, Nahanni and Baffin Island Parks, Mr. Chretien said, "We now have the framework of an outstanding national system - but we must not stop here. There is much more to be done if we are to protect our natural heritage. We have 28 parks now and we need at least 60 by the year 2000. We are in a race against time."

The "race against time" is really a race to save some land from development. In March 1971, Mr. Chretien said, "If we are to acquire new park lands, we must move quickly before they are alienated or destroyed by industrialization and urbanization or priced beyond the public pocket book (40)". We have waited for the

fulfillment of this obligation in the north, perhaps believing in remote areas there was plenty of time. But the picture has changed. The Mackenzie River Delta, the Arctic Islands and other northern areas, until recently virtually untouched, are no longer remote, silent wilderness. North from Edmonton, seismic lines crisscross the land in every direction. In central Baffin Island and elsewhere in the north, empty fuel drums litter the tundra. If we wait any longer for our northern parks, we will inherit only second-hand landscapes, unworthy of national park ideals of preserving some land for solitude for the human spirit, wilderness adventure, and the enjoyment of natural beauty.

Besides preservation of our scenic gems and natural treasures, national parks are for recreation. Park use is exploding in Canada. "By 1985, we will likely have about four times the national park visitations we had in 1967 (41)".

This increased park use is a function of many factors; population growth, increased leisure time, more money available for recreation, more information about parks circulated by mass media (42). As well, Canadian parks feel pressures from overcrowding in U.S. parks, where at the height of the season, campsites fill before noon. 12,629,101 people visited Canadian National Parks during the 1969-70 fiscal year (43). As this number swells, supply must be better matched with demand, in order to avoid serious overcrowding with attendant destruction of park values.

This demand for outdoor recreation is manifest in northern Canada as well as in the south. Tourism ranks second among resource-based industries in the Yukon (44). Carr predicts it will expand three- to four-fold by 1985. "It will expand more rapidly if adequate provision is made for national park recreation."

The 10,700 square mile Kluane region represents 5.2% of the Yukon. Kluane National Park, at 8,500 square miles,

is 4.1% of the Yukon. Total national park holdings, Kluane included, make up less than 1.5% of Canada.

Compromise possibilities

Multiple Use - The concept of "multiple use" was developed by the U.S. Forest Service, which employs it to manage land for a combination of timber production and recreation in U.S. National Forests.

In April, 1969, Mr. T.J.R. Godfrey of the B.C. and Yukon Chamber of Mines, proposed that a "Territorial Park" be established at Kluane, managed for multiple use (45). This would be a small park, as the Chamber opposes large parks - "It is our contention that it is not in the public interest to lock up vast sections of promising mineral country, where no mining is allowed." (46).

This was not a realistic compromise. It implied that wilderness recreation and mining are compatible land-uses, that national park values are not destroyed by mine roads, tailing piles, open-pit operations, or

the noise of heavy machinery. It does not take into account that many people find spiritual values in immensely beautiful scenery.

The Chamber's proposition was that a Kluane Park be managed by the Yukon Territorial Council rather than the National Parks Service, because a multiple-use park could not be established within the legislative and policy framework of National Parks. Both the U.S. and Canadian national park agencies recognize the hazards in multiple use for areas of outstanding natural beauty. The Canadian National Parks Policy reads:

"Mining, lumbering, prospecting, commercial fishing, oil exploration and production, even hunting - these all would rob the people of Canada of all that is unique within the national parks and much of their attraction and beneficial purpose..."

Multiple use clearly must not be allowed in our National Parks or National Park Reserves. Such areas must be managed according to the words of our National Parks Policy as:

"...sanctuaries of nature where people can relax and enjoy themselves amid a natural environment, (which) precludes the exploitation of the natural resources for their commercial value."

Arthur Laing, Minister of the Department of Northern Affairs and National Resources in 1964, when reading this Policy Statement in the House of Commons, went on to say:

"Canada is a land still rich in natural resources. We have not yet reached the desperate stage in our growth where every cubic yard of the land must be squeezed for whatever material potential it may have."

Multiple use is no compromise for national parks lands. It eventually means loss of many biological, scenic, and aesthetic resources.

Core Principle - The National and Historic Parks Branch recently abandoned its former plan to establish a core park at Kluane, with adjacent lands to be added later, as discussed. However, in case such a concept arises again regarding northern parks, the following points are important.

Inherent in the core principle is the idea that the scars of mining can be healed and wilderness easily restored. Restoration of land after large-scale mining has yet to be demonstrated in Canada, except on a small scale such as gravel pits in southern Ontario. When suggesting that it is possible at Kluane, one must not forget that Kluane is far north, where soil genesis and plant growth is slow, resulting in scant depths of topsoil. Short frost-free seasons result in retarded activity by soil microfauna.

In most areas, vegetation will grow back on man-altered land if organic topsoils remain intact or are replaced. However, climax communities are replaced by early successional seres - there are few shortcuts to ecological succession. While to the untrained eye the land looks healed, in fact it may bear little resemblance to the original environment - altered are abiotic factors including soil moisture, temperature, light, and the resulting community structure, including avifauna, small

mammals and other elements of food webs. In some mining operations outside parks, in areas of little ecological significance, these alterations may be acceptable. In other areas, they may not.

Natural events also alter environments, setting land back to earlier successional seres - fires, rock slides, avalanches, floods. In a national park, areas changed by such forces are of significance. No natural environments are static. Acceptance of natural change is inherent in the concept of "preservation" as applied to living ecosystems. As such, it is part of national parks. But, while the results of such forces may be similar to the results of some activities of man, namely ecological change, the natural method of change fits the concept of parks; change brought about by resource exploitation does not.

Other activities involved in mining or its exploration are even less easily healed. Land underlain with permafrost may be susceptible to severe

erosion initiated by vehicle tracks. Rock debris regenerates very slowly if piled high by dredges or left high on slopes where annual floods will not replace organic matter.

To allow mining to precede park status in the north, therefore, is to invite the permanent impairment of park values.

ECOLOGICAL AND PARK VALUES AT KLUANE

Kluane is classified in "Natural Region No. 6 - Northern Coast Mountains", according to the National Parks System Planning Manual (47). This classification, developed by the National and Historic Parks Branch, serves to "identify known features or areas having National Park potential and provides a basis for examining the balance of the country for future National Park areas". It also is designed to "minimize subjectivity in the process of new park selection".

According to this classification, Canada is divided into "Natural Regions", based on "physiographic regions and coupled with ecological, geographical and geological considerations". This forms a basis for park planning that is much more sensitive to the environment than judicial boundaries.

Natural Region 6, and adjacent Region 7, encompass most of northern British Columbia (north of the Skeena River) and all but the northern section of

the Yukon. No national parks other than Kluane, exist within these two Natural Regions, or Region 9 to the north. The park on the South Nahanni River lies farther east, in Natural Region 8.

According to the Planning Manual, Natural Region 6 includes two major physiographic features: the Icefield Ranges and the Kluane Ranges. It includes three subsections of boreal forest: Kluane Section, Central Yukon Section, and the Stikine Plateau Section. Both physiographic features and the Kluane Section of boreal forest are included in Kluane National Park.

The Planning Manual also outlines "Natural History Themes". These are:

"groupings of like natural features and phenomena which may be observed in one or more Natural Regions. In a completed National Park System of Canada, all Natural History Themes found in the country would be included in one or more National Parks. These Themes become one means by which each of the Natural Regions may be assessed for National Park potential."

"Natural History Themes" are grouped under three categories: land forms, geological history, and land ecosystems. While a great variety of items listed in these categories occur in Kluane, the Planning Manual makes specific mention of what is considered the most important "natural history values warranting national park representation" at Kluane. These are:

- "-Mount Logan, highest in Canada, plus adjacent high mountain group.
- massive icefields and glaciers
- work of glaciers
- northern mountain mammals: Dall sheep, mountain caribou, etc."

For a park at Kluane to include these values, it must be large. Mount Logan is given specific mention; to include it, the western boundary of the park must fall at least partially along the extreme western boundary of the Kluane Game Sanctuary (the Yukon-Alaska border) as it does. To include mountain caribou, the eastern boundary must encompass the east

slope of the Kluane Range near the Alaska Highway, which it does not.

While useful as far as it goes, the Planning Manual attempts an overview of Canada. Values listed for Kluane, therefore, are far from complete. A more detailed analysis follows.

Kluane offers two features, both of paramount importance for land worthy of park status - variety and uniqueness. Variety allows the visitor opportunities to enjoy a diverse landscape in one general area; uniqueness presents the visitor with natural features worthy of admiration, which are not easily found elsewhere. These combine, under the concept of parks, to become living museums of nature, as expressed in our National Parks Policy: "The fundamental purpose of a national park is comparable to that of a museum or art gallery."

The National Parks Policy sets out criteria for potential national parks:

"1. To be considered as a potential national park an area must be worthy of preservation. This means that it should:

- i) be an outstanding example of the best scenery in Canada, or
- ii) have unique scenery, geographical or geological features of national interest or
- iii) have outstanding examples of flora and fauna of national interest, or
- iv) provide outstanding opportunities for enjoying appropriate non-urban forms of outdoor recreation amid superb surroundings."

As stated above, any one of these four criteria are sufficient for the establishment of new national parks. However, Kluane meets all four criteria.

Dealing with i), nowhere in Canada are similar wide valleys, spaced-out mountains, ice sheets, valley glaciers, melt-water lakes, braided rivers, all of which combine to make this truly an example of the best scenery in a country endowed with much natural beauty.

Related to iv) Kluane offers a chance for wilderness recreation and long-distance back-packing in a pristine environment. Accessible wilderness is relatively scarce, since the price of accessibility is usually wilderness loss. And being accessible, less strenuous forms of recreation are possible - roadside camping, picnicking, and other activities, as will be discussed.

Criteria ii) and iii), "unique" or "outstanding" examples of geographical and geological features, as well as flora and fauna of national interest, will be outlined first to describe the variety of features at Kluane, secondly to describe specific unique features.

Natural Variety

Geographical and Physiographical Variety - Kluane Game Sanctuary, within which the Park lies, consists of parts of 2 major mountain chains, both with associated plateaus. Ten major river valleys and 4 major lakes drain these mountains. The St. Elias Mountain chain (Icefield Ranges), highest in North America, is the

predominant physiographical feature. Crowning these mountains is Mt. Logan, Canada's highest mountain (19,850 feet). The Alaska-Yukon boundary runs along the peaks of the St. Elias Mountains. Across the summit is the largest icefield outside polar regions in the world. To the west, in Alaska, the range falls into the tidewater of the Gulf of Alaska.

The east side of the St. Elias Range falls into a narrow trough, the Duke Depression. This trough consists of a chain of valleys and plateau surfaces with the valley tongues of the St. Elias icefield extending into it and forming the headwaters of rivers that generally flow north-east.

The Kluane range lies east of the Duke Depression, with lower elevations of approximately 8,000 feet. Ten river valleys cut the Kluane range, draining the Duke Depression or the icefields themselves. These rivers all flow into a broad valley, the Shakwak Trench, running parallel to the mountain chains. The Alaska

Highway traverses this valley. The Shakwak Trench is 2 to 5 miles wide, and cradles Kluane Lake (largest in the Yukon) and farther south, Dezadeash Lake.

From a park planning standpoint, valleys provide by far the most useable land. The high mountains are essential as a scenic backdrop but people will concentrate, and roads, trails and facilities will be built, primarily in the valleys. For the full park values to be included within the national park at Kluane all 10 valleys leading from the Alaska and Haines Highways to the St. Elias Range should be included. This is absolutely necessary in order to accommodate future recreational opportunity without overcrowding and hence destroying Kluane's prime contribution to our national park system - the feeling of northern wilderness. In addition, unique features are scattered through these valleys, as will be discussed. The Park, as declared, includes 4 of these valleys completely, 3 more in their upper reaches

only and excludes the remaining 3 valleys. From north to south, the valleys are:

White River (not within Kluane National Park)

Koidern River (not within Kluane National Park)

Donjek River (upper valley in Park, lower valley near highway excluded)

Duke River (upper valley in Park, lower valley near highway excluded)

Slims River (within Park)

Jarvis River (upper valley in Park, lower valley excluded)

Dezadeash-Alsek River (within Park)

Kathleen Lakes (within Park)

Mush-Bates Lakes (within Park)

Takhanne-Tatshenshini River (not within Park)

The climate in the Kluane region is variable. The Kluane Range is in the rain shadow of the St. Elias Mountains (Map 2). Moist Pacific air rising over the St. Elias Mountains feeds the great icefield, but by the time it reaches the Shawkak Valley, the air is dry.



Tatshenshini River

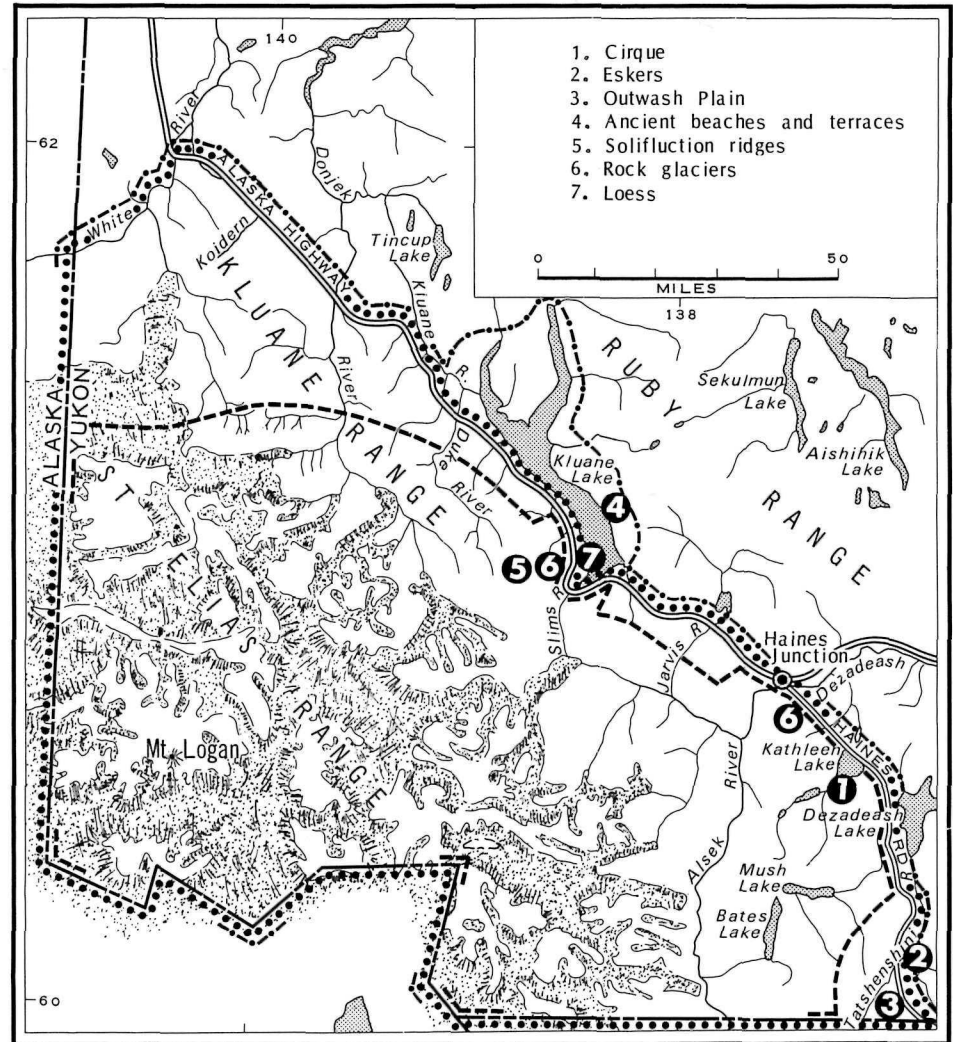
This Valley has an annual precipitation of less than 13 inches, of which less than half occurs during the summer months. The warmest month is July, with an average mean temperature of 59°F at valley floor elevations (48). Being in the north, summer days are long, over 19 hours at maximum sunlight.

Geological Variety - Many of the geological features at Kluane have been created by a series of up to 4 glacial advances during the Pleistocene epoch (49).

Ancient glaciers spilled out of the St. Elias Range and into the Shaskwak Valley, covering all but the highest mountains at the time of maximum glaciation. They left behind many interesting features: cirques and eskers. By altering drainage patterns, they created outwash plains, ancient beaches and terraces. The present day action of ice, wind and water can be seen by solifluction ridges where the ground slips on steep mountain sides, loess or wind-blown sand deposits, and yearly changes in the levels of Kluane Lake dictated by changes in drainage. (The location of examples of these features are shown on Map 4).

Bedrock geology of the region has been thoroughly studied (50,51,52) and its detail, presented in geological reports, is of value to park interpretation.

Map 4. Some Geological Features in the Kluane Region





Arctic Poppy (Photo by Deirdre E. Griffiths)

Floral Variety - The St. Elias Range has been described by Scotter et al. as "unique in the northern land masses for its diverse plant and animal life within sight of the huge glaciers (53)".

Three major biotic types exist in the Kluane region: boreal forest, sub-alpine vegetation, and arctic-alpine tundra.

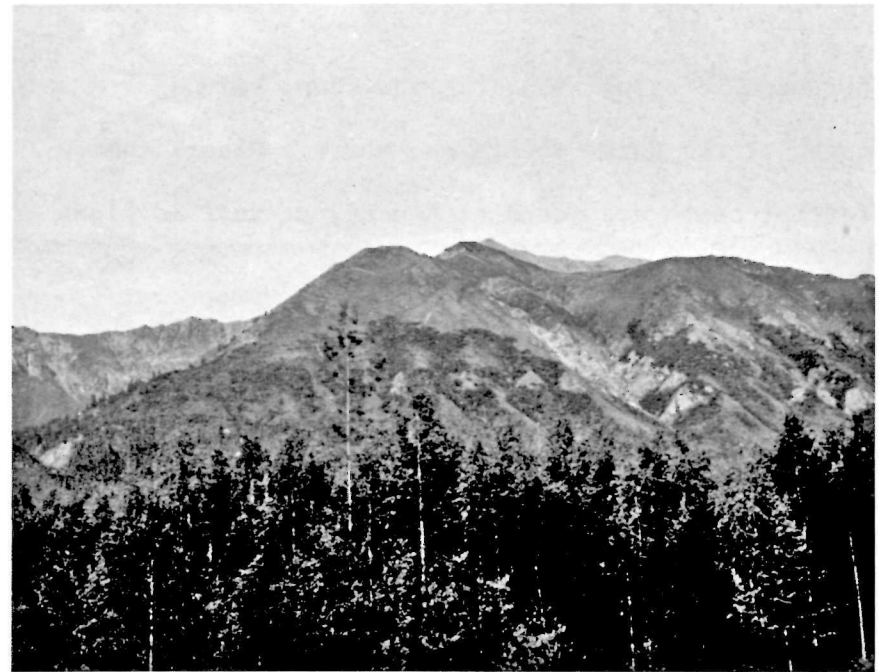
Boreal forests are found throughout Kluane below approximately 3500-4000 feet. The tree line is low, due to the high latitude. White spruce (Picea glauca) predominate in climax stands, while aspen (Populus tremuloides) and balsam poplar (Populus balsamifera) predominate in sub-climax stands. Low willows (Salix spp.) and birch (Betula glandulose) grow under this tree vegetation. This shrub layer is often composed of the same species found in sub-alpine conditions at higher altitudes. Along streams and rivers, willows are most common.

Above 3500-4000 feet, tree growth gives way to

shrubs, mainly a low-growing species of birch, mixed with willow. Below these shrubs are often plants and flowers typical of tundra conditions.

Above the sub-alpine is true tundra, where plant growth rarely exceeds 12 inches. This zone is a wild-flower garden through much of June, with a great variety of species growing in various sub-habitats - well-drained and poorly-drained, flat land, rock ridges, and steep slopes.

Within these broad biotic types is considerable variety. Various natural physical agents change vegetation associations, and allow the student of botany a full-range of successional variety. Rocks recently exposed from glaciers show the entire successional continuum from lichens and mosses to woody vegetation. Natural fire has resulted in openings which are colonized first by various grasses and bright-coloured fireweed (Epilobium angustifolium), later by aspen and willow. Wind-blown sand deposits provide a



Three major biotic types: boreal forest, sub-alpine vegetation, and alpine-arctic tundra.

substrata for grassland vegetation which later gives way to aspen trees.

Variety is added, too, by the location of Kluane, situated at the south-east edge of a larger region in central Alaska which was not glaciated during the Pleistocene era. Plant and animal species are present

at Kluane that survived the "Ice Age" in this far northern refugium (54). In addition, being just north of the Rocky Mountains, montane plants common farther south are found at Kluane, as well as flora of the Great Plains (55).

The 3 major biotypes described here - boreal, sub-alpine, tundra, exist throughout the Kluane range and slopes of the St. Elias Mountains below permanent ice. They could all be represented in a small park established almost anywhere within this region. But their prime value is the expanse of wilderness they provide in aggregate over the whole region. On a small scale they represent plant associations worthy of preservation in the context of "outstanding examples of flora and fauna of national interest (56)". But on a large scale they offer much more - a chance to provide wilderness recreation and long-distance hiking trails in both forest and tundra, along river valleys and ridges, beside glacial lakes, and in ancient lake beds.

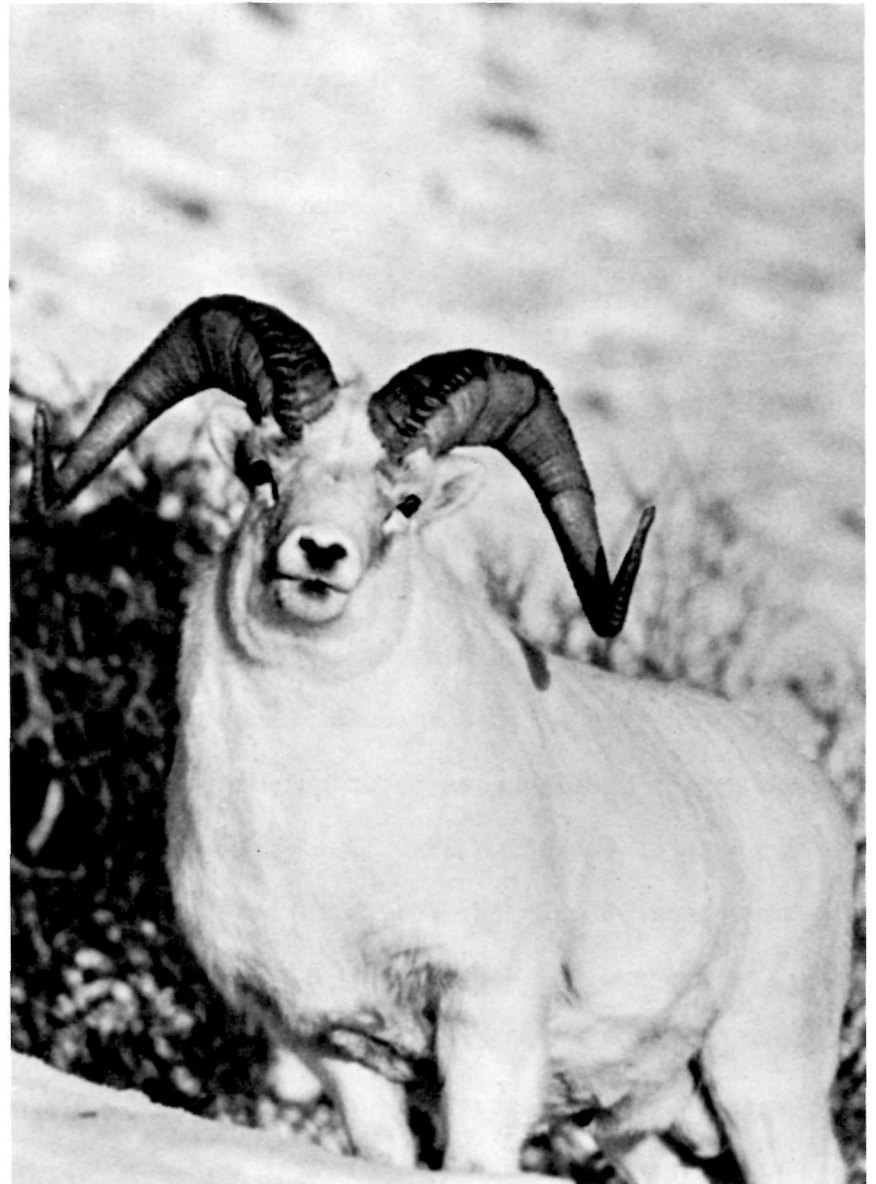
They offer a chance for man to be alone in a natural setting, a resource in itself, and to meet the challenges of wilderness travel. That national parks fulfill this obligation is a stated objective in the National Park Master Plans currently being produced for all Canadian National Parks by the National and Historic Parks Branch. In these plans, Class II land is described as an area where "the primary aim is preservation of a wilderness recreation environment in direct contrast to life in a modern urban setting. Riding and hiking trails, primitive campgrounds, and wildlife habitat are typical features."

Mammalian Variety - "It is part of National Park purpose to maintain the quality and beauty of wildlife in National Parks, i.e. to maintain healthy populations of natural animals in balance with their environment (57)".

The Kluane Sanctuary was originally established to protect its assemblage of big game species unique

in Canada. But in addition to big game, other mammals join to make this area one of high mammalian biomass for a northern environment. Describing the "spectacular" Kluane Sanctuary, former Canadian Wildlife Service biologist, Dr. A.W.F. Banfield, said, "the northern tundra-clad foothills, situated in a moisture shadow of the higher southern peaks (St. Elias Mountains) constitute excellent big game range because of their limited annual snowfall (58)".

Big game species are moose, Dall sheep, mountain goats, mountain caribou, and recently a small number of mule deer. Moose frequent all 3 biotypes, but predominantly boreal areas. They are most often seen in willow vegetation along water-courses. They are members of the largest sub-species in North America, Alces alces gigas, common in Alaska but found in good numbers only at Kluane in Canada. Kluane National Park, as declared, includes considerable moose range. However, the success of moose depends in part upon the degree



Dall Sheep (Photo by Val Geist)

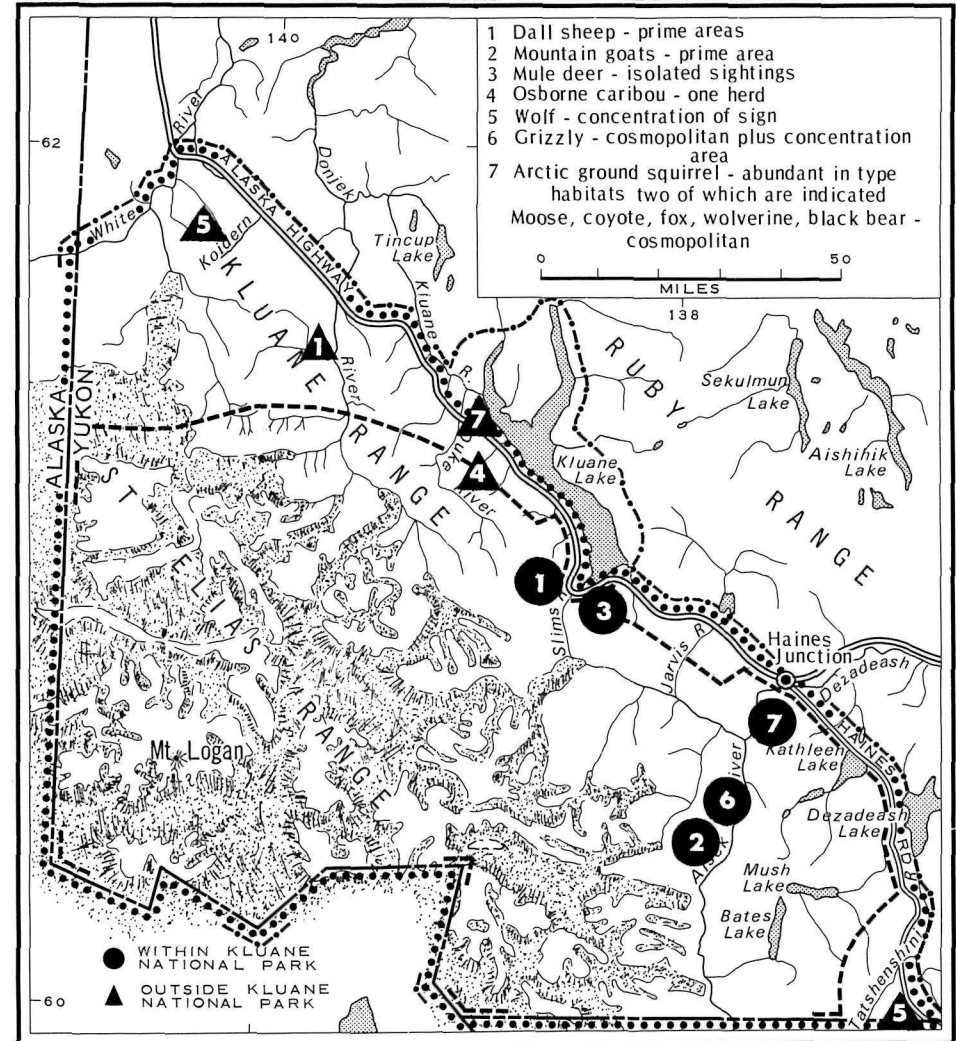
of protection given them in the lowland valleys outside the Park, especially on wintering grounds.

Dall sheep of the subspecies Ovis dalli dalli are pure white, and are easily seen because of their grassland and tundra habitat preference. The Kluane Sanctuary is near the southernmost edge of their range. Two areas within the Sanctuary are especially known for sheep - Sheep Mountain (within the Park) and Wolverine Creek (outside the Park).

Mountain goats inhabit rocky slopes and cliffs, usually above timberline in summer. Kluane is near the northern edge of this species' range and in the Kluane region itself goats occur only in the southern half, south of the Slims River Valley (Map 5), with the exception of only one published observation (59).

Caribou are not abundant in the Kluane Sanctuary. In 1960, Banfield considered 100 animals to be a liberal estimate. Today, one band of approximately 125 animals is known, spending much of their time on the Burwash

MAP 5 LARGE MAMMAL RESOURCES OF THE KLUANE REGION



Uplands. Occasional sightings indicate that some caribou exist in the northern section of the Sanctuary as well (60). These caribou are believed to be members of the largest race in Canada, this judgment being based on a comparison of measurements of individuals collected in northern British Columbia (61) and those from other races collected across the Canadian north (62). Scotter (63) et al. referred to this race as the "giant mountain caribou". Banfield states, "The Kluane Sanctuary seems to be one of the last strongholds of the Osborn Mountain caribou in the Yukon (64). Elsewhere, this race, Rangifer tarandus osborni, lives only in northern British Columbia. Barren-ground caribou have been recorded at Kluane Lake, but seldom migrate into the area (65).

Despite mention as a "natural history theme" all known caribou ranges have been excluded from the Park. The Burwash Uplands are within 5 miles of the eastern

boundary. This particular band of caribou has an exceedingly great value to the park planner - it occupies a small range and provides perhaps the only opportunity to include in a national park the entire range of a significantly large number of caribou.

Mule deer have recently been sighted east of the Slims River, and may be extending their range into the area (Map 5). The area of sightings is on the boundary of the Park.

The carnivores, too, are well represented in the Kluane region - wolves, coyotes, foxes. Wolf sign is abundant and the animals are sometimes seen on the willow tundra near "Bear Flats" and the Tatshenshini River, and near the Koidern River. Both of these areas are outside the Park (Map 5). The wolf has very high aesthetic value in a park, especially today as the fear and hate for the wolf is being largely replaced with respect. F.F. Darling, internationally-known ecologist, closed the historic "tundra conference" held in

Edmonton in 1969, with the following - "As a species, humanity has not done a very good job by the wolf, but the days of being frightened of it are over and I think the fact that the Arctic can still produce wolves should give us hope for the future (66). Kluane's wolves often move out of the mountains onto Kluane Lake itself in winter. In the past they have been poisoned there. For that reason itself, the national park must include all of Kluane Lake. Both the National Parks Policy and Canada's National Wildlife Policy (67) read, "National Park planning should give full consideration to character, size, shape and location of park areas in order to provide for year-round ecological requirements of the indigenous animal species, especially those with migratory habits."

Coyotes and red foxes are found throughout the area, denning in sandy banks along rivers and streams. Grizzlies and black bears also are widely scattered through the area. Grizzlies concentrate in the Alsek

River Valley which is within the Park (Map 5) where Canadian Wildlife Service biologist Dr. A.M. Pearson has conducted Canada's only detailed study of this species. In a paper presented at the Arctic International Wildlife Range Conference in Whitehorse, October 1970, Dr. Pearson said, "In order to save the grizzly, large areas must be set aside where the protection of the species takes precedence over activities of man. This needn't eliminate man's activities but it would so modify them as to ensure protection for the grizzly (68). Such is entirely within the scope of national parks.

Alaska brown bears have been reported occasionally in the Alsek and Tatshenshini Valleys (69,70). According to Hoefs et al. "A Kluane National Park may protect some of the few Alaskan brown bears on Canadian soil."

Wolverines are common in the Chilkat Pass region on the south edge of Kluane (71). In winter their tracks

are abundant. Lynx are probably common, but they are a secretive animal, and densities are hard to assess.

Supporting the smaller carnivores is, at present, an exceedingly dense snowshoe hare population living throughout the boreal biotype. Winter feeding of hares establishes browse lines on aspens in many areas. Also, very dense colonies of Arctic ground squirrels live in specific locations. Two such colonies, which are easily accessible, are at the Dezadeash River within the Park and the Duke River outside of it. (Map 5)

In total, 29 mammalian species have been described in Kluane. The density of mammals, plus the open nature of most river valleys, sub-alpine and tundra habitats makes this area second to none for observation, photography and study of wildlife. Past and present research on grizzlies, Dall sheep, plus the aforementioned mammalian reconnaissance studies, provide much information for the Park's interpretive programme.

W.A. Fuller investigated 6 areas of the Yukon in



Arctic ground squirrel

1958, and rated them for suitability as a national park (72). Regarding wildlife, he stated that "a Yukon Park should contain Dall sheep, caribou and grizzlies. Other desirable, but not essential, large game species are moose and goats, both of which are common elsewhere." Inasmuch as the presence of a large variety of species

adds greatly to the value of a National Park, every effort should be made to include in Kluane Park sufficient habitat for all of the species which Fuller mentions, plus the wolf and the Duke River colony of the Arctic ground squirrel. Summarizing Map 5, prime ranges of the 4 most important species include:

Slims River - Dall Sheep (within Park)

Wolverine Creek - Dall Sheep (outside Park)

Burwash Uplands - Caribou (outside Park)

Alsek River - Grizzly (within Park)

Tatshenshini River - Wolf (outside Park)

Koidern River - Wolf (outside Park)

Kluane Lake - Wolf (outside Park)

These areas, then are essential to Kluane National Park if full variety of wildlife is to be gained. With such variety present, protection of the necessary habitat for these species forms one of the most important reasons for a large park.



Spruce grouse

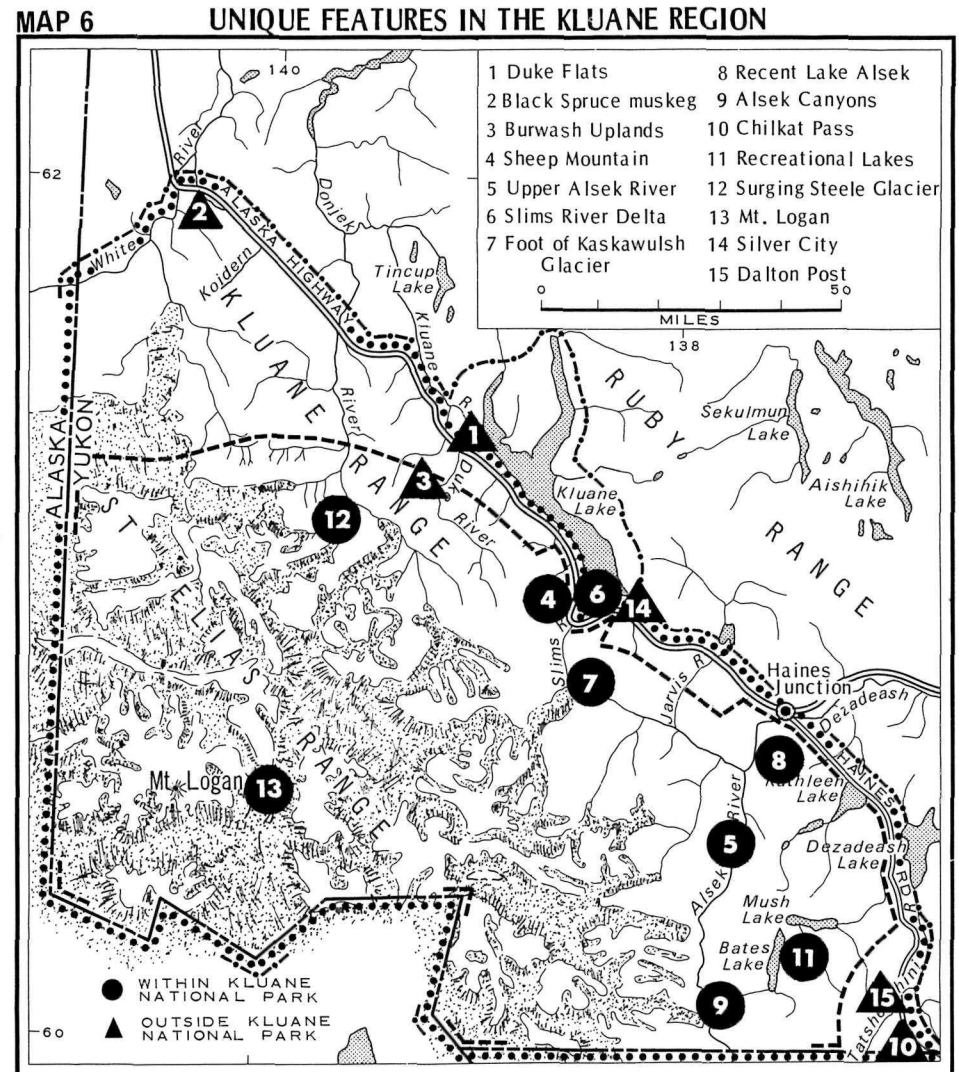
Avifaunal Variety - Because of its geographical location on the edge of west coast biotic area, great plains, northern tundra, and the Alaska glacial refugium, bird life at Kluane is diverse for a northern latitude, and represents a unique mixture of species in North America.

Circumpolar species such as willow and rock

ptarmigan live on the tundra slopes. Townsend solitaires and varied thrushes, normally at home in the Douglas fir and lodgepole pine forests of the Rockies, inhabit the boreal regions in Kluane. Species which survived Pleistocene glaciation in the Alaska refugium also live here - Alaskan grey jays and western tree sparrows. Birds of the eastern forests such as spruce grouse, pine grosbeaks, myrtle and blackpoll warblers nest at Kluane. Magpies, typical of dry grasslands, are found in the Shawkak Valley.

In Appendix I are listed the species of birds observed by the author in June, 1971, and June and July 1972. More complete data on Kluane's bird-life are found in a number of research papers (73,74,75).

Mew gulls diving at a bald eagle, golden-crowned sparrows singing their three-note song in the northern dusk, a spotted sandpiper guarding its nest of four splotched eggs, arctic terns swooping down to ward off an intruder, a sharp-tailed grouse performing its



broken-wing display, a red-necked grebe covering its eggs and slipping into the water of a pristine lake - these are the contributions of Kluane's avifauna to a national park. The author enjoyed these sights and sounds in June, 1971 but not all in one river valley. Kluane's birdlife is spread throughout the Sanctuary. To preserve the birdlife and at the same time maintain low human densities that allow people to enjoy the birdlife in a non-destructive manner, requires the maximum amount of valley land within the park.

As a museum of nature, Kluane therefore offers considerable variety - geographical, geological, floral, mammalian, avifaunal. Some of this is preserved in Kluane National Park, some is not.

In a mountain park of limited valley land, visitors are usually directed to the location of natural features. While this is worthwhile, it takes advantage of only part of the value of natural features. The additional value gained by individual discovery is worth much

more. This is part of the adventure of wilderness experience. For this, and for the sake of the living things themselves, Kluane National Park should include all 10 river valleys.

Unique Features

Society places high value on unique artifacts of man. The old, the rare, the vanishing, things distant in time and space, are treasured in our libraries, art galleries and museums. That such protection also applies to natural things is stated explicitly in our National Parks Policy Statement as discussed.

Map 6 lists the location of unique features in Kluane. Undoubtedly there are many more known to various scientists and naturalists who have studied in the area. Many features remain to be discovered.

Describing those identified by the author:

1. Duke Flats - Here, aspen parkland, vegetation typical of the northern fringe of the great plains, grows on sand which was both carried by water and



Duke Flats, with aspen parkland vegetation.

blown down the Duke River Valley long ago. An exceedingly dense Arctic ground squirrel colony inhabits the flats. Foxes, and probably coyotes, den on its edge. Grassland birds such as upland plovers nest here (76). This area is unique both in being a "misplaced" representative of a more southern biotic type and because of its vegetation growing on wind-

blown deposits. The Duke Flats are not at present included within the Park.

2. Black spruce muskeg - unique in the western Yukon is approximately 25 square miles of wetlands covered by black spruce (Picea mariana) and interlaced with numerous small ponds. This area is the best water-



Black spruce muskeg of Pickhandle Lake area in northern Kluane.

fowl nesting ground in the Kluane region. It is also densely populated by furbearers, primarily muskrats and mink. Moose are abundant here, as are wolves and black bears. A deep mat of sphagnum moss covers the ground; one often sinks a foot deep in this soft yellow-green carpet. Many wildflowers of various colours grow on this green mat.

On the west side of the area, the land rises along the foot of the Kluane range. Black spruce gives way to white birch (Betula papyrifera) uncommon elsewhere in the Kluane region.

Existing cuts for claim staking allow relatively easy foot travel, but trails built specifically for hiking would make better use of scenic values. All of this area is also at present outside the park.

3. Burwash Upland - Caribou Range - this, too, is an area not now included in the Park, but which should

be. Most tundra in Kluane is found on steep slopes. The Burwash Upland, however, is a relatively flat plateau of about 20 square miles. It is adjacent to and easily accessible from the Alaska Highway. Here is the obvious place for nature interpretation of upland tundra.

Kluane's only band of mountain caribou are found here, and, as mentioned, since they are members of a relatively uncommon race and are few in number, they deserve protection.

4. Sheep Mountain - This open slope, which is within the Park, has been long recognized as a winter and spring range of a few hundred Dall sheep. In floral composition, the south slope of Sheep Mountain is actually "misplaced" prairie grassland, with grasses such as Agropyron sp. As well, one rare sage, Artemesia rupestris, grows here. Sheep Mountain is situated beside the Alaska Highway, and Dall sheep, when present, are easily visible.



Sheep Mountain, traditional Dall sheep range, adjacent to the Alaska Highway.

5. Upper Alsek River - Also within the Park, this is prime grizzly bear habitat, where these animals have been the object of an intensive research study. Information exists on den sites, movements, and food habits of these bears, of considerable value to nature interpretation. As a vanishing species in Canada, this population requires protection

under the principle stated in our 1966 National Wildlife Policy, "A primary objective of wildlife management in the Territories is to prevent the population of any species from declining to a level from which it might not recover (71)."

6. Slims River Valley Delta - Glacial silt flowing down the Slims River from the Kaskawulsh Glacier, and wind-blown sand coming down the valley are filling in one end of Kluane Lake at a rate of approximately 158 feet per year (78). Prairie grasses colonize these sands. Processes of delta-building, normally spanning generations, are telescoped here into decades. At present the delta is on the park boundary.

7. Foot of Kaskawulsh Glacier - Two river systems originate at the 5 mile wide foot of the Kaskawulsh Glacier. One, the Kaskawulsh River, flows into the Alsek River and terminates in the Gulf of Alaska 140 miles from the Glacier. Out of the same glacial foot flows the Slims River into Kluane Lake, and

hence the Yukon River, reaching tidewater in the Bering Sea after a 1,400 mile journey. Annual variations of a few feet in the height of Kluane Lake are partially due to changes in the proportion of water flowing from the two rivers originating at the Kaskawulsh Glacier. This Glacier, which is in the Park, is relatively accessible from the Slims River bridge on the Alaska Highway.

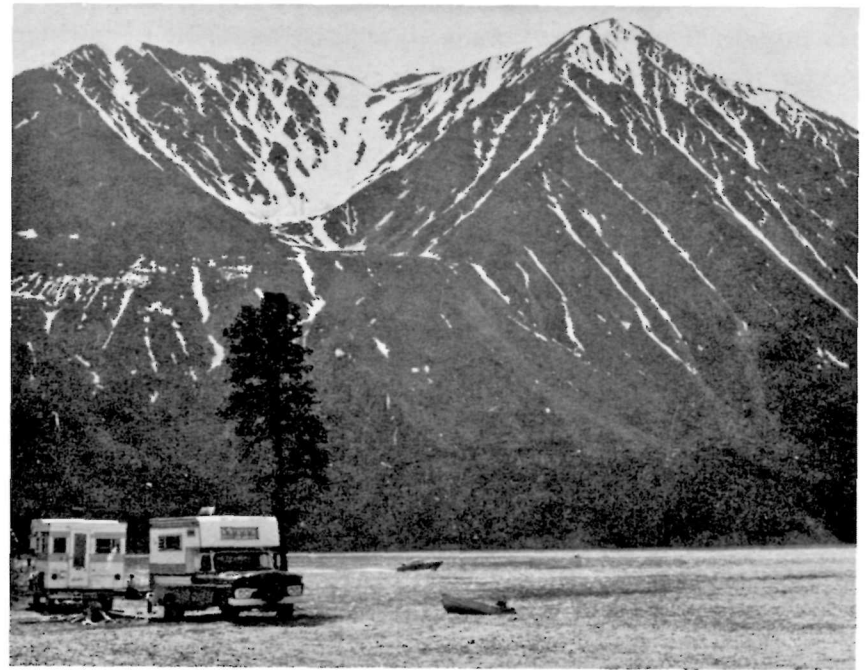
8. Recent Lake Alsek - Also within the Park are well-developed beaches of sand, gravel and boulders marking the shoreline of Recent Lake Alsek, along the upper Dezadeash and Alsek Rivers. At one point the uppermost beach is 265 feet above the present Dezadeash River. Advances of the Lowell Glacier across the Alsek River caused this Lake. "The last phase of Recent Lake Alsek may have ended little more than 100 years ago (79)." Here a visitor can actually walk in an extinct lake-bed, looking up at gravel beaches that once

marked the surface of the Lake.

9. Alsek Canyon - Again within the Park are the steep canyon walls of mesozoic granites and crystalline limestone which rise 1000 feet on each side of the turbulent Alsek River for 5 miles below its junction with the Bates River. Twelve miles upstream is the foot of Lowell Glacier, which terminates at the edge of the Alsek River, forming a meltwater lake of approximately 2 miles diameter. A two thousand foot rock wall rises from its opposite shore.
10. Chilkat Pass - The Chilkat Pass, which is outside the Park, is the broadest of the 3 passes (Chilkat, White, Chilkoot) that lead from tidewater to the Yukon's interior, stretching one to 5 miles. across the St. Elias Range. The Haines Highway runs through this Pass. All but the north end of the Pass is in British Columbia. Future investigations should be made to determine if B.C.'s portion of the Pass should be added to the national park. Predominant

vegetation on the Pass is low dwarf birch interspersed with wet sedge-willow marshes and patches of bryoids. Glacial features are evident - eskers, outwash plains, scree slopes. Spectacular mountains rise on both sides of the Pass. Of significance is the low vegetation, making wildlife observations relatively easy. Moose frequent the willow tundra associations; wolves are sometimes seen; foxes and wolverines den here; bird life is rich for such a northern latitude. Weeden (80) described 81 species of birds that migrate through or nest in the Pass.

11. Recreational Lakes - Lakes are of immense importance in national parks, as sites for camping, fishing, canoeing, and for scenic values. Kathleen, Mush and Bates Lakes, within the Park, are deep, clear and cold. All are set off by majestic mountains. A Yukon Government campsite is situated on the east shore of Kathleen Lake.



Kathleen Lake, from a Yukon Government campsite

- This beauty spot should become the main campground of Kluane National Park. It can be easily serviced from the Haines Highway. All 3 lakes contain large lake trout; Kathleen also contains arctic grayling, rainbow trout and Kokanee.
12. Surging Steele Glacier - Reported as "stagnant" prior to 1966 (81), the Steele Glacier surged 7 miles in

4 months in 1967 (82). The surge ended prior to March, 1968 (83). As a dramatic example of sudden glaciation, the Steele Glacier is an important feature of the Park. Much information exists on this surge, and a series of maps which will illustrate the complete history of the surge is near completion (84).

13. Mt. Logan - Towering 19,850 feet, Mount Logan, Canada's highest mountain and North America's second highest mountain, is an impressive and valuable feature of Kluane National Park.

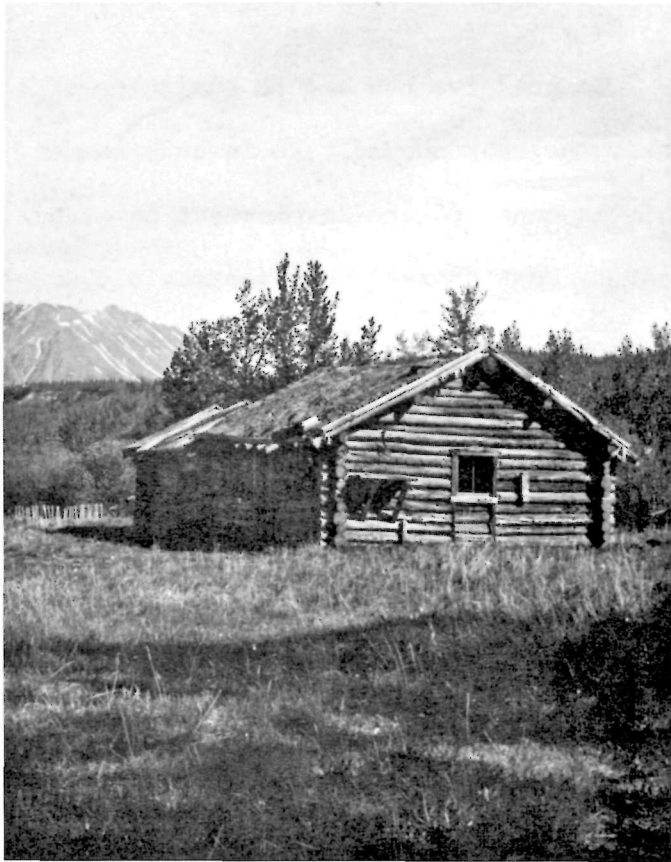
14. Silver City - Of historic significance, but not included at present within the Park, is the deserted mining camp of Silver City beside the Alaska Highway on the south side of Kluane Lake. Built in 1904, this "city" was a trading post, roadhouse and police barracks on the wagon road from Whitehorse. It was inhabited until 1924. About 10 log buildings

with sod roofs remain. A sign describing the site has been erected by Mr. A. Innis-Taylor of Whitehorse.

Silver City could be used for historic interpretation of the region if developed as a satellite of a main interpretive centre.

15. Dalton Post - Established in 1898 by Jack Dalton, this post, now outside the Park, serviced part of the 305-mile-long Dalton Trail which stretched from Haines at tidewater in Alaska to the Yukon River at Fort Selkirk. During the Dawson gold rush, miners used this as one route from Skagway and Haines to the gold fields. About 8 log buildings with sod roofs still exist, nestled beside the fast-flowing Tatshenshini River, and set among high mountains. The Post can be reached from the Haines Highway by a 5-mile gravel mining road.

As a valuable adjunct to the park, serious consideration should be given to preserving the entire Dalton Trail. The present popularity of



Dalton Post, an historic feature.

hiking the Chilkoot Trail underlines the desirability of doing so.

16. Kluane Lake - At present not included in the Park,

"Kluane Lake is an outstanding feature of the Shawkak Valley and exhibits unique characteristics" (85) such as unusual fluctuations in levels up to 10 feet.

Besides this, Kluane, the largest lake in the Yukon, abounds in large lake trout and grayling, and is surrounded by mountains. "Kluane" is a Chilkoot Indian word for "big fish". Little human development other than a few log cabins exists on its east side; the Alaska Highway winds along its west side. Being large, it creates a different feeling than Kathleen, Mush and Bates Lakes. Strong winds generated by the nearby glaciers often whip up waves quickly. However, during calm periods small boats can easily use the Lake.

Kluane Lake is also important because of its winter use by wolves.

If included in any future revision of boundaries, Kluane Lake could become the physical focal point



Kluane Lake, focal point of the Kluane region.

of the new park. Small campsites already exist along its west shore beside the highway. Here is an opportunity to provide uncrowded roadside camping for many people. The east side of the Lake should remain a wilderness, only accessible by boat. It consists of the Ruby Mountains, a chain of undulating

hills.

To preserve the scenic qualities of Kluane Lake, the Park should take in both shores. Unless this is done, future development on either the east or west shores would destroy the scenic integrity of this Lake. The eastern boundary of the park should run along the peaks and ridge-tops adjacent to the Lake on its east side.

17. Volcanic Ash - An unlocalized unique feature of the Kluane region that is within the Park, is a layer of white granular volcanic ash, exposed in some places, buried under layers of soil in others. It lies exposed in the road cuts just south of the Donjek River bridge. The source of the ash was a volcanic eruption near the present Yukon-Alaska border in the upper White River Valley, which occurred approximately 1,400 years ago (86).

In summary, the ecological and park values identified here are scattered over the 10,700 square mile region.

Fuller's (87) assessment of park potential in 1958, treated the Kluane region in 2 sections; north (Donjek) and south (Dezadeash). Both these areas were considered superior to 3 other areas he assessed outside Kluane. He ranked each area primarily in terms of scenic features, wildlife and potential visitor use. The Dezadeash area (within the Park) rated highest, with 77 points, and the northern Donjek area (outside the Park) rated second, with 73 points. The primary features identified by Fuller in the Dezadeash area included: large variety of use by the public, the greatest variety of songbirds and the historic Dalton Trail. However, Fuller favoured the Donjek area, despite its slightly lower score. The Donjek area "contains scenery of greater grandeur", although the smaller northern lakes do not "measure up in any way to Kathleen Lakes and Mush and Bates Lakes." The Donjek area also rated higher in "wildlife (especially caribou) and wilderness type of use."

Summarizing Fuller's study, he identified approximately equal values in the southern and northern areas of Kluane. However, each has very different values, all pertinent to national parks. The southern area falls within Kluane National Park; the northern area does not.

In the more superficial discussion of Kluane appearing in the National Parks System Planning Manual, the previously mentioned "Natural History Themes" identified by the National and Historic Parks Branch exist in western and eastern Kluane: Mount Logan in the west inside the Park, and Caribou Range in the east outside it.

From all this it is evident that the important natural features of the 10,700-square-mile Kluane region identified in this report as worthy of inclusion in the Park are scattered. By creating a park that does not include the entire region, a serious loss of ecological and park values has resulted.



Steele Glacier and Icefield Ranges

CONCLUSIONS

Kluane National Park, with its boundaries to encompass 8,500 square miles, is a compromise of mining and park values. From a mining standpoint, it means loss of known mineral deposits but no known ore reserves of commercial significance. However, mineral values may change, exploratory techniques may improve, and future wealth may be "locked up" within Kluane National Park. It is this, rather than the documented mineral wealth at Kluane today, that draws the opposition of some elements of the mining industry. If, however, in a vast country like Canada, we cannot take this chance on less than 1.5 per cent of our land which is in National Parks, and the Yukon cannot take this chance on less than 5 per cent of its land, we must indeed be facing economic ruin. In the Yukon, mineral reserves are scattered; there is no place one can fit a large wilderness park without overlap with some deposits which some day may be important. To argue

against large parks is to fail to understand the significance of another form of land use now increasingly in demand.

From a park standpoint, the compromise position of the Federal Government in establishing less than the full 10,700-square-mile region as a park, has meant considerable loss of ecological and park values.

These losses include:

1. Loss of wildlife values. Most regrettable is exclusion of all mountain caribou range, also of Dall sheep ranges near Wolverine Creek; wolf ranges in the Tatshenshini and Koidern Valleys and at Kluane Lake; some of the mule deer range as recently reported east of the Slims River.
2. Losses of unique features. The major loss is exclusion of the scenic and recreational values of Kluane Lake. Other losses are the Duke Flats, black spruce muskeg, Chilkat Pass region and the historic

sites of Silver City and Dalton Post.

3. Losses of valley land adjacent to the Haines and Alaska Highways. Of the 10 valleys crossing these Highways, only four are within the Park. Considering that over half the Park is ice, with another third consisting of steep slopes, this loss of valley land potentially useable by people is to be deplored. There is a frightening parallel here with one of North America's most famous land-use mistakes - the destruction of Hetch Hetchy Valley in California, sister valley to Yosemite. With the growing demand for outdoor recreation completely unforeseen in the early 1900's, Hetch Hetchy Valley was flooded, compounding greatly the pressures of overuse in Yosemite today. The parallel lies in both Kluane and Yosemite being mountain parks of great beauty, where most of the land is inaccessible and valley land is at a premium. Kluane's limited valley land might some day too face destruction of

its wilderness character by overcrowding.

While the ecological and park values of the key areas now excluded from the park in deference to the mining industry are not easily measurable in economic terms, a strong case has been made by the evidence provided in this Report for expanding the park to include them.

Although we cannot put a precise dollar figure on them, we know from experience that it is these values which draw people in ever-increasing numbers to National Parks in both Canada and the United States. We know also from experience that National Parks generate, directly and indirectly, enormous dollar revenues locally, regionally and nationally, through the strong, everlasting attraction of their natural wonders.

In setting the present boundaries of the park, the Government has aimed at an equitable compromise between mining and park needs. However, the withdrawal from mineral exploration and development of another 2,200

square miles to allow inclusion in the park of those areas of exceptional value for park purposes, which this report argues for, would not seem to lessen to any significant degree the Government's objective in this direction. The area in question represents but 16% of the Yukon's copper-nickel belt, which so far has proved unproductive, and only 5.2% of the Yukon Territory as a whole. The pending closure for economic reasons of the Hudson-Yukon Mine's operation at Quill Creek, the only mine now operating in the Kluane region, underlines the very small risk of any major ore body being sacrificed by such a move.

On the other hand, there seems little doubt that by enlarging Kluane National Park to its full 10,700-square-mile potential, both the people of the Yukon and indeed all Canada would gain immeasurably in the long run.

"Climb the mountains and get their good tidings.
Nature's peace will flow into you as sunshine
flows into trees.
The winds will blow their own freshness into
you and the storms their energy, while cares
will drop off like autumn leaves."

- John Muir

APPENDIX I

Birds Observed in the Kluane Region, Summer 1971, 1972

| | | |
|------------------------|------------------------|------------------------|
| Common loon | Upland plover | Gray jay |
| Arctic loon | Common snipe | Black-billed magpie |
| Red-throated loon | Hudsonian curlew | Common raven |
| Red-necked grebe | Spotted sandpiper | Black-capped chickadee |
| Horned grebe | Solitary sandpiper | Boreal chickadee |
| Mallard | Wandering tattler | American robin |
| Baldpate | Greater yellowlegs | Varied thrush |
| Green-winged teal | Lesser yellowlegs | Gray-checked thrush |
| Lesser scaup | Least sandpiper | Hermit thrush |
| Common goldeneye | Northern phalarope | Swainson's thrush |
| Barrow's goldeneye | Herring gull | Mountain bluebird |
| Harlequin | Mew gull | Townsend's solitaire |
| White-winged scoter | Bonaparte's gull | American pipit |
| Surf scoter | Arctic tern | Bohemian waxwing |
| Red-breasted merganser | Great horned owl | Orange-crowned warbler |
| Goshawk | Hawk owl | Myrtle warbler |
| Red-tailed hawk | Great grey owl | Yellowthroat |
| Rough-legged hawk | Belted kingfisher | Blackpoll warbler |
| Harlan's hawk | Yellow-shafted flicker | Wilson's warbler |
| Golden eagle | Say's pheobe | Red-winged blackbird |
| Bald eagle | Traill's flycatcher | Rusty blackbird |
| Marsh hawk | Least flycatcher | Pine siskin |
| Gyr Falcon | Eastern pheobe | Red crossbill |
| Pigeon hawk | Western wood pewee | White-winged crossbill |
| Sparrow hawk | Olive-sided flycatcher | Savannah sparrow |
| Spruce grouse | Horned lark | Slate-coloured junco |
| Sharp-tailed grouse | Violet-green swallow | Tree sparrow |
| Rock ptarmigan | Tree swallow | Chipping sparrow |
| White-tailed ptarmigan | Bank swallow | White-crowned sparrow |
| Willow ptarmigan | Barn swallow | Golden-crowned sparrow |
| Semi-palmated plover | Cliff swallow | |

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