

# The Northern Yukon

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## A Unique Heritage

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My first view of the Northern Yukon was from a helicopter, flying along the Arctic coast in June 1975. The ice had not yet left the shore, and two tugs were still frozen in at Herschel Island. Seals were everywhere on the ice. As we turned away from the ocean, I could see three grizzlies on the tundra. Then, as we left the coast and headed across the British Mountains, I saw hundreds of caribou, part of the Porcupine herd. They had already been to the coast to calve, but they had not yet come together in their magnificent annual aggregation, when tens of thousands of animals move together across the land. Caribou were scattered on the coastal plain, in the foothills and in the mountains.

At the coast, the tundra was still brown but as we went up the Firth River we began to see trees. At first there were just a few, then more and more until, by the time we reached Old Crow Flats, there were trees everywhere and the earth was green.

Old Crow Flats lie on an alluvial plain with mountains in the far distance on all sides. The Flats comprise a multitude of lakes, through which the Old Crow River meanders. I saw caribou, moose and thousands of waterfowl on the Flats, and there, too, I met the people of Old Crow.

I visited a dozen camps on the Flats, where people from Old Crow were out hunting muskrats. They go out "ratting" in the middle of May, when the ice still covers the lakes, and come back in mid-June, when the ice has gone. They trap muskrats on the ice until it thaws; after that they hunt them with rifles along the shore, travelling by canoe. At each camp there were two or three tents, and there were muskrats everywhere.

The people hunt at night under the midnight sun, and during the day they skin their catch. The pelts are put on stretchers to dry, and the meat is hung on racks.

The native people came here long ago from the Old World, across the Bering Strait. A fleshing tool, made from a caribou leg bone and notched by man, has been found by archaeologists on Old Crow Flats. This implement, used to scrape the flesh from hides, is estimated to be about 30,000 years old, and it may be the oldest evidence we have of the entry of man into the western hemisphere.

The Yukon interior is the only substantial region of Canada that was not overrun by glaciers during the Pleistocene Epoch. Only here in the Yukon and in adjoining parts of Alaska can we obtain a relatively complete and continuous record of human occupation of the tundra and the boreal forest.

Like Columbus thousands of years later, the people who came from Asia to the western hemisphere did not realize they had set foot upon a new continent. In small family or kinship groups, they crossed the land-bridge that once linked Asia with North America. They lived by hunting large mammals — mammoth, bison, horse and caribou; of these, only the caribou has survived in this region.

The caribou have been the mainstay of the native people of Old Crow for thousands of years. Today these people are apprehensive, because they fear that the caribou, and thus they themselves, are threatened. They know the power of the white man. They know that elsewhere the great animal herds have died off with the advance of agriculture and industry. They have seen the white man come and dominate them and their land. Exploration crews, bulldozers and the airstrip that crowds their village against the

Porcupine River are continuing reminders of this encroachment. These people fear that the white man may destroy their land and the caribou. They and the caribou have made a long journey together across time and the continents. Is this journey to end now?

The caribou go to the Arctic Coastal Plain of the Yukon in summer to have their young. Many factors combine to create a uniquely favourable habitat for their calving grounds there. Good forage provides the high levels of energy that the caribou need to bear and nourish their young, then to migrate southward, and to survive the winter. In summer, when the sun never sets, the coastal plain seems never to sleep. It is a place of growth and productivity, of movement and sound. But the summer lasts for only a short time. Winter, which lasts some eight months of the year, is bitterly cold and, but for the wind, silent.

Once fed and fattened, the caribou gather in their tens of thousands and travel in a great herd through the foothills and the mountains far southward into the boreal forest. The native people of Old Crow have always taken caribou as they migrate southward, and the energy that the animals stored up while grazing on the coastal plain nourishes the people through the winter. These animals are the last link in a food chain that transfers energy from the sun, through plants, then through the caribou, to man. And the people of Old Crow need only a very small proportion of the herd for their food.

In the old days, but still within living memory, the Old Crow people intercepted the caribou on their migration in late summer and fall by driving them into huge corrals, the outlines of which can still be seen. They consisted of poles lashed together with willow roots to form a fence and were



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placed along the herd's main migration routes. Because they stood among the trees, they were not readily visible. Some fences had wings up to three miles long, and an inner pocket one-quarter to one-half mile deep. Once inside the fences, the caribou were caught with snares and speared. The corrals illustrate the technological ingenuity of the native people.

About the turn of the century, the people began to obtain rifles and, within a year or two, the caribou fences were abandoned. Today only their outlines can be seen: so quickly may one technology displace another. The native people welcomed that change, for it enabled them to harvest caribou more effectively. But they do not see the technology that Arctic Gas propose to introduce into the Northern Yukon in the same way. They see it as a threat, and they are deeply concerned about what its effects may be on their environment, their way of life and their community.

The Northern Yukon is an arctic and subarctic wilderness of incredible beauty, a rich and varied ecosystem: nine million acres of land in its natural state, inhabited by thriving populations of plants and animals. This wilderness has come down through the ages, and it is a heritage that future generations, living in an industrial world even more complex than ours, will surely cherish.

In late August, thousands of snow geese gather on the Arctic Coastal Plain to feed on the tundra grasses, sedges and berries, before embarking on the flight to their wintering grounds. Just as the caribou must build up an energy surplus to sustain them, so must the geese and, indeed, all other arctic waterfowl and shorebirds store up energy for their long southward migration to California, the Gulf Coast, or Central and South America.

The peregrine falcon, golden eagle and

other birds of prey nest in the Northern Yukon. These species are dwindling in numbers because of the loss of their former ranges on the North American continent and because of toxic materials in their food. Here in these remote mountains they still nest and rear their young, undisturbed by man.

One-fifth of the world's whistling swans nest along the Arctic coast of the Yukon and in the Mackenzie Delta region. The Old Crow Flats, the Delta and the Arctic coast provide critical habitat for other waterfowl, including canvasback, scaup, scoter, wigeon, old squaw and mallard. These northern wetlands are particularly important during years of drought on the prairies. Then the waterfowl flock North in much larger numbers than usual, and are thus able to survive to breed again in the South in more favourable years.

You will find polar bear on the ice along the coast, the barren-ground grizzly on the open tundra, and the black bear around Old Crow Flats. You will find moose and Dall sheep, wolf, fox, beaver, wolverine, lynx and, of course, muskrat.

But of all the species of the Northern Yukon, the barren-ground caribou is the most important to the people of Old Crow. On this animal they have always depended for a living. The Porcupine herd, which now stands at about 110,000 animals, is one of the last great herds of North America.

The Northern Yukon is a place of contrasts: of an explosively productive but brief summer and of a long, hard winter; of rugged mountains and stark plains. Its teeming marshes and shorelands give it a beauty equalled by few other places on earth. The ecosystem is unique and vulnerable.

This is why the proposal by Arctic Gas to build a pipeline across the Northern Yukon, to open up this wilderness, poses a threat.

This ecosystem, with its magnificent wildlife and scenic beauty, has always been protected by its inaccessibility. With pipeline construction, the development of supply and service roads, the intensification of the search for oil and gas, the establishment of an energy corridor, and the increasing occupation of the Northern Yukon, it will no longer be inaccessible to man and his machines.

The proposal by Arctic Gas to build a pipeline across the Northern Yukon confronts us with a fundamental choice. It is a choice that depends not simply upon the impact of a pipeline across the Northern Yukon, but upon the impact of the establishment of a corridor across it. Opening up this country to industrial development will have lasting effects on the great wilderness and on the native people who live there.

In this chapter, I shall try to outline the full nature and consequences of that choice. Arctic Gas have proposed two possible routes through the Northern Yukon: the Coastal Route and the Interior Route. I have concluded that there are sound environmental grounds for not building the pipeline on the Coastal Route. There are also sound environmental grounds for not building it on the Interior Route, but they are not as compelling as they are in the case of the Coastal Route. However, the social impact of a pipeline along the Interior Route would be devastating to the people of Old Crow. I recommend, therefore, that no pipeline be built across the Northern Yukon along either of the proposed routes. If a pipeline must be built to carry Alaskan gas through Canada to markets in the Lower 48, then it should follow a more southern route.

Yukon Coastal Plain and British Mountains.  
(E. de Bock)

Coastal tundra near mouth of Firth River.  
(I. MacNeil)

Babbage River flowing from mountains onto  
Yukon Coastal Plain. (GSC—P. Lewis)

Brooks Range. (ISL—G. Calef)



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## The Pipeline and the Corridor

The pipeline that Arctic Gas propose to build across the Northern Yukon would carry gas from Prudhoe Bay in Alaska to markets in the United States. This pipeline would extend eastward from Prudhoe Bay to join the Mackenzie Valley pipeline in the Delta area.

### Coastal Route and Interior Route

Arctic Gas would like to build their pipeline from Alaska along the Arctic Coastal Plain of the Yukon. If they are not allowed to use the Coastal Route, they want to use a route that would bring the pipeline close to Old Crow and Old Crow Flats. This they call the Interior Route.

The Coastal Route runs from Prudhoe Bay 195 miles across Alaska to the international boundary, and 131 miles from there across the Yukon. This route is entirely on that part of the Arctic coast referred to as the north slope or the coastal plain. Arctic Gas propose to build the pipeline along the Coastal Route in winter, using a packed snow working surface and snow roads: they say they will not build a permanent, gravel road along the route. Pipe, construction materials and equipment will be shipped to wharf and stockpile sites along the Arctic coast during the summer by barge. Snow roads will be needed in winter to transfer the materials to construction sites along the right-of-way. There are two DEW Line stations on the Arctic coast of the Yukon. Some native people, most of them from Aklavik, use the

area seasonally to hunt and fish, but there are no communities.

In Alaska, the Coastal Route would cut across 133 miles of the Arctic National Wildlife Range. Because the Government of the United States may not permit Arctic Gas to build a pipeline across the Wildlife Range, the company proposed the Interior Route as an alternative to the Coastal Route. This route skirts the southwestern margin of the Wildlife Range, then swings eastward across the Yukon Territory to the Mackenzie Valley. In crossing the Brooks Range in Alaska, it passes through some 80 miles of steep-sided narrow valleys, and here construction would have to take place in summer. It would involve trenching in rock and across steep unstable talus slopes. In 1974, Arctic Gas estimated that a pipeline along the Interior Route would cost about \$500 million more than one along the Coastal Route and around the Delta.

Throughout most of its length in Alaska and the Yukon Territory, the Interior Route is remote from other transportation routes. Arctic Gas propose to transport pipe, construction materials and equipment to the right-of-way by temporary winter roads from the Dempster Highway in Canada and from the Alaska State road system at Circle. Some of these access roads would be more than 100 miles long. Most of the Interior Route would be built in winter using snow roads for access; it would not require permanent gravel roads or gravel working surfaces. But the section of the route that passes through the Brooks Range, and possibly short parts of it through the Richardson Mountains, would be built from a gravel pad in summer, and Arctic Gas propose to make one of the access roads to the pipeline from the Dempster Highway a permanent road. The pipeline will, therefore, encroach in a

major way on the hunting, trapping and fishing territory of the Old Crow people. The proposed route also passes close to Fort McPherson and through hunting areas in the Yukon and the Northwest Territories that are used by native people from Fort McPherson and Aklavik.

### Energy Corridor Across the Yukon

If Arctic Gas build a pipeline across the Northern Yukon along either the Coastal Route or the Interior Route (or any other route), we cannot assume that no other energy transportation systems will follow. The Pipeline Guidelines foresee that, once a gas pipeline is built across the Yukon, an energy transportation corridor will have been established and another pipeline will follow. That is why the Pipeline Guidelines insist that, in assessing the impact of the first pipeline, it is necessary to consider also the cumulative impact of a second pipeline and any other industrial development along the route. Nonetheless, Arctic Gas based their case on only the initial gas pipeline. In my opinion, this approach is unrealistic. Once an overland route has been approved for a gas pipeline from the north slope of Alaska to markets in the Lower 48, oil and gas exploration in the North will be intensified. Oil and gas exploration and development in Northern Alaska is only just beginning, and the petroleum potential of the Alaska North Slope province is very large. Even at Prudhoe Bay, present planned production of oil and gas is based on incomplete knowledge of the full extent of the field. Dr. Robert Weeden, speaking for the Government of Alaska, said:

The location of the proposed pipeline corridor



facilities could in turn lead to the development of oil and gas within the Arctic National Wildlife Range, as well as the Beaufort Sea Offshore Province specifically, and could influence the development of the entire Alaskan arctic coastal area including Naval Petroleum Reserve Number 4, which lies to the west of the Colville River and encompasses approximately 23 million acres. [F7462]

Moreover, construction of a pipeline along either the Coastal or the Interior Route would accelerate oil and gas exploration and development in the Yukon Territory. Thus, if the Coastal Route is used, exploration may be expected on the coastal plain and offshore, beneath the shallow waters of the Beaufort Sea. On the other hand, if the Interior Route is chosen, it would spur oil and gas exploration on the Old Crow Flats and the Eagle Plains. The latter area has already been extensively explored and some petroleum discovered.

I consider that, once a gas pipeline is built across the Northern Yukon, increased exploration is inevitable. There will be demands for a second gas pipeline and, later, a hot oil pipeline. Vern Horte, President of Arctic Gas, told the Inquiry it is likely that the whole Arctic Gas pipeline system would be looped. An oil pipeline, for at least part of its length, would be elevated rather than buried in the ground to avoid the adverse effects of the hot oil pipe in ice-rich permafrost. Also, a permanent road or roads would probably be built to service the oil pipeline and other facilities and to provide access to the energy corridor.

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## Man and the Land: Old Crow

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The people of Old Crow are the only people who live permanently in the Northern Yukon. What does the land mean to them? When I took the Inquiry to their village, they told me that, in their view, the construction of a pipeline across the Northern Yukon would change their homeland and their way of life forever.

The Arctic Gas pipeline on the proposed Interior Route would pass between the village of Old Crow and Old Crow Flats. If this route were followed, a construction camp of 800 workers would be established near the village. The people of Old Crow do not look forward to that prospect, but, at the same time, they oppose a pipeline along the Coastal Route, because of the threat it represents to the calving grounds of the Porcupine herd on the coastal plain: they believe that the decline of the herd would undermine their way of life. Whichever route the gas pipeline takes, it may be followed by an oil pipeline, and by increased gas and oil exploration and development along the route. The people of Old Crow realize the implications of this.

The whole village told me they were opposed to the pipeline. I heard 81 people testify; virtually everyone, man and woman, young and old, spoke and they spoke with one voice. Here are the words of 21-year-old Louise Frost, who expressed the feelings of her people:

I can see our country being destroyed and my people pushed on reservations, and the white men taking over as they please. . . . The pipeline is only the beginning of all this. If it ever does come through, there will be a time when other companies will want to join in on this. Any major development that has taken

place in the North has been of a rapid nature. Their only purpose in coming here is to extract the non-renewable resources, not to the benefit of northerners, but of . . . southern Canadians and Americans. To really bring the whole picture into focus, you can describe it as the rape of the northland to satisfy the greed and the needs of southern consumers, and when development of this nature happens, it only destroys; it does not leave any permanent jobs for people who make the North their home. The whole process does not leave very much for us to be proud of, and along with their equipment and technology, they also impose on the northern people their white culture and all its value systems, which leaves nothing to the people who have been living off the land for thousands of years. So to put it bluntly, the process of the white man is destroying the Indian ways of life. [C1569ff.]

To assess the environmental and social impact of a pipeline across the Northern Yukon, we must understand the relation between the people of Old Crow and the land and animals.

The fall caribou hunt, when the animals migrate southward to their winter range, after they have fed and fattened on the coastal plain and the nearby mountains, has always been the most important event in the yearly cycle of the Old Crow people. They believe the pipeline will interfere with the caribou migration and break what they see is the essential link between their past and their future. Peter Charlie told the Inquiry about the caribou migration:

People used to travel back and forth . . . and in the fall after the freeze-up, the caribou would migrate up around Driftwood River, and they crossed the river there, and when the caribou does that, that means that there's going to be caribou amongst the timber country. And when they hear that, it makes the people very happy that the caribou have migrated into the timber country. Now, this migration that I am telling you about happened many, many

The village of Old Crow. (I. MacNeil)

Louise Frost. (J. Falls)

Father Jean-Marie Mouchet. (J. Falls)

Old Crow. (E. Peterson)



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years ago. Now today, the caribou still migrate the same way. Every fall, my children go up the river, and they get the meat from where these caribou migrate. Now today, I hear about the pipeline that is going through, it's going to spoil all these routes where the caribou migrate. It really makes me sad to hear about the pipeline. [C1390ff.]

The Old Crow people fear that the proposed pipeline, whether it follows the Interior or the Coastal Route, would adversely affect the Porcupine caribou herd and therefore their way of life. A pipeline on the Coastal Route would disturb the caribou on their calving range and could reduce the size of the herd. A pipeline along the Interior Route could interfere with the herd's migration pattern and thus with the people's ability to hunt them. If the herd's migration routes were altered, the people of Old Crow might be as effectively deprived of caribou as they would be if the herd were diminished.

The people of Old Crow are also concerned about the impact of the Interior Route on the Old Crow Flats and on the animal and fish populations there. Peter Lord explained:

The Crow Flats is the migrating ground for caribou, and also it's a breeding ground for moose in summer. . . . Also, we use it for muskrat. It is a good breeding ground for muskrat and . . . for furbearing animals, such as fox, lynx, mink and sometimes marten [and] wolverine. . . . Its many streams . . . all carry fish, and it's a very good spawning place for fish in the summer. All fish go up Crow River and into the little creeks and up to the little lakes. [C1284]

The spring muskrat hunt on Old Crow Flats is an event of cultural and economic significance to the people of the village. It provides meat, cash from the sale of fur, and an opportunity for the whole family to get out onto the land.

The people fear not only the impact of the

Interior Route on Old Crow Flats but also the gas and oil exploration that they believe would follow the grant of a right-of-way and the designation of an energy corridor. The threat of the Interior Route is obvious and immediate. Alfred Charlie, speaking through an interpreter, put it this way:

One time he went to Whitehorse to a meeting about this Crow Flats, and there were a lot of people in that meeting from different places. . . . He told those people that if people start to come to Crow Flats to drill for oil and do their seismic in Crow Flats, they will probably mess up the place, and then probably if they strike oil under Crow Flats, everything will be messed up. . . . He told those people, some of you are working, some of you are government people; you make money, you put money in the bank. He said [Old Crow] people don't do that: they don't put money in the bank, but when they want to make money, they use Crow Flats for a bank, they go back there to trap and hunt muskrat so they use it as a bank. . . .

He heard lots of good things about the pipeline from different people from the oil companies . . . but we don't hear no bad things, everything is going to be perfect. But there's going to be trucks, there's going to be bulldozers and other vehicles that travel over the land, and all these travel by power, oil power and gas power, and they will be refuelling different places and they are going to spill a lot of oil on the ground. . . . They will pollute the water with it. Perhaps fish will get sick from this, too. Suppose we eat fish like that and people don't expect to live healthy with that kind of food. Our main food in Crow Flats is muskrat . . . and supposing we eat sick muskrat from this polluted water. [C1358ff.]

These concerns are shared by all generations at Old Crow. Lorraine Netro, 19 years old, testified:

I was born and raised in Old Crow. . . . The proposed pipeline route is supposed to be put through the most important piece of land to the Old Crow people, the Old Crow Flats. I do

not agree with this pipeline route at all. . . . The young people, my generation now, will need this land for our future, and also for the future of our children. We depend on this land as much as our parents do. . . . If the pipeline comes through, what will become of our future? . . . Are we going to look forward to dead or sick muskrats floating around in the polluted lakes, or forests with no birds singing? I do not think any . . . person will even go out into this kind of country to try to hunt in that kind of hunting ground. All that they could do is to remember how beautiful and rich this land used to be. I do not want to see this happen to our land, and to our people. . . . I hope we can keep on living the way we are today, for tomorrow and forever, developing in our own way for generations to come. I do not want the proposed pipeline route through our country. [C1560ff.]

The Old Crow people expressed deep concern about the impact the construction of the pipeline would have on the social fabric of the village. They feel that, whichever route the pipeline follows, new people and new influences will come to undermine the traditional values of the village. When the development cycle has run its course, the Old Crow they know today will no longer exist. Marie Bruce testified:

Meaningful existence means a lot to the people of Old Crow. It is probably the most important thing in a person's life. I [would] like Old Crow to be the way it is today. . . . Old Crow will end up deserted like Dawson City . . . in 1898, there was a gold rush in Dawson and people from all over the world went there. When it was over, everyone left Dawson City. This also will happen to Old Crow. It will be very hard to go back to your own way of life after this happens. . . . It is a good feeling when you have nothing or no one to fear in Old Crow. Everyone knows each other here, and they all help make it a better place to live. . . . You can still go to bed here without locking your doors, and you can still walk alone at night without any fear. [C1529ff.]



James Allen is an Indian employed at Old Crow by the Yukon Lands and Forest Service. He had this to say:

If the pipeline moved a camp of 800 men near Old Crow, I think it would be disastrous for the community as a whole. Many of the social diseases which have destroyed many Indian communities in the South would move in, such as alcoholism, child abuse, mental and physical health, broken homes, broken marriages, and many other points that break down a healthy society. Also, where there are 800 men, some sort of liquor outlet soon follows. Liquor would become easily obtainable in the village. The white people say money is the root of all evil, but in our Indian communities today, liquor is the root of all evil. [C1559ff.]

The white people who live in Old Crow feel the same way. The Anglican minister, the Reverend Mr. John Watts, told the Inquiry that, although the church is still important in the lives of the villagers, he feared the situation would change with pipeline construction and the presence of many outsiders. The serious impact of the Alaska Highway on native communities in the Southern Yukon, a generation ago, undermined native values and community life there; he feared that this history may be repeated in Old Crow.

Father Jean-Marie Mouchet, the Roman Catholic priest at Old Crow, told the Inquiry of the code that governs life in Old Crow: it is a complex web of shared understanding and experience within which people carry on their lives. Father Mouchet expressed the fear that outsiders, attracted to the region by the pipeline, would neither understand nor respect this code.

Herta Richter, a nurse in Old Crow, opposed the pipeline:

... the pipeline will certainly be a great disaster to this area, and I'm not sure if I could tolerate to stay here after it comes. It would be

too painful to see the change in these people and in the surroundings. [C1579]

The people of Old Crow have expressed their fears about a pipeline along the Interior Route, which would be, of course, an immediate threat to their village. But they know, also, that a pipeline along the Coastal Route would threaten the calving grounds of the Porcupine caribou herd, and, if a pipeline along the Coastal Route were to lead to the loss of the herd, the impact of its loss on their village and on their way of life would be great. The choice we have to make is not, therefore, between the Coastal Route and the Interior Route. The choice is whether or not we should build a pipeline across the Northern Yukon at all. The preservation and maintenance of the Porcupine caribou herd are of fundamental importance to the survival of the people of Old Crow.

To the people of Old Crow, the pipeline is symbolic of the white man's ways and his values. Their opposition to the pipeline is so strongly and deeply felt that a decision to proceed with it in the face of their opposition will be to them the clearest affirmation that their way of life and everything they cherish as valuable is, in the eyes of the white society, worthless. It would mean the end of Old Crow as the people know it.

I will turn later to the views of social scientists on this subject, but the people of Old Crow have summed up the situation for themselves. Indeed, there is as much wisdom in Old Crow as there is in Ottawa. In the words of Alice Frost:

Do [the white people] have a right to ask us to give up this beautiful land of ours? Do they have a right to spoil our land and to destroy our wild game for their benefit? Do they have any right to ask us to change our way of life, that we have lived for centuries? Do they have any right ... to decide our future? We live peacefully ... in harmony with nature,

here in Old Crow. You won't find very many places like this left in this world. [C1566]

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## Porcupine Caribou Herd

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### *Sensitivities and Concerns*

The Porcupine caribou herd, comprising 110,000 animals or more, ranges throughout the Northern Yukon and into Alaska. It is one of the last great caribou herds, and it accounts for about 20 percent of the caribou in North America. The Porcupine herd has flourished until now because of the isolation of its range. The only communities within it are Old Crow in the Yukon and Kaktovik and Arctic Village in Alaska. The herd is vulnerable to the changes that will accompany industrial development and increased contact with man.

A caribou "herd" is defined as a group of animals that calve in a traditional area different from that used by other groups. The calving grounds of the Porcupine herd are on the Arctic Coastal Plain — on the tundra near the shore of the Beaufort Sea in Northwestern Yukon and Northeastern Alaska. Every spring the Porcupine herd leaves the spruce forests of the interior of the Yukon — the Ogilvie Mountains, the Eagle Plains and the Richardson Mountains — where they have wintered, to travel hundreds of miles north to calve. They begin their journey, which may cover 800 miles, in March. At first they move slowly, and they usually reach the Porcupine River late in April. We still do not know how the caribou learn to follow their migration routes, but we do know that in their migration to the coast they leave behind most of the wolf population — a major predator — which dens during April



Caribou herd. (G. Calef)

Caribou calf harassed by biting insects.  
(C. Dauphiné Jr.)

Little Bell River, Yukon Territory. (ISL—G. Calef)

Caribou on winter range. (G. Calef)



and May. The arrival of the herd at the calving grounds in late May or early June, before the blood-sucking insects emerge, is predictable.

Calving takes place between late May and mid-June on the sedge meadows and the ridges of the coastal plain and the foothills from Babbage River in the Yukon to Camden Bay in Alaska. After the calves are born, the animals come together to escape the impact of the mosquitoes and botflies and begin to move eastward along the coast. This post-calving aggregation of a large part of the Porcupine herd within a few square miles is one of the last remaining marvels of the natural world in North America. It may be compared to the massing of buffalo, a sight that will never be seen again.

The herd continues its post-calving migration eastward along the coastal plain through July, but by August it begins to migrate southward towards the fall and winter range. In September large numbers of caribou pass through Old Crow Flats, crossing the Porcupine River later in the same month. The rut occurs in mid-October in the mountains.

Most of the Porcupine caribou herd spends nine months of the year in the interior of the Yukon and Alaska. This country offers both open habitat and forest, and in it caribou can move from low areas to higher ground to locate favourable plant or snow conditions, or relief from insects. This herd may be in a better position than other Canadian herds to avoid sudden losses by the failure of a given plant food, or unfavourable weather.

Most of the biologists who gave evidence at the Inquiry regard continued use of the calving grounds as essential to the survival of the herd: any interference with them or with the post-calving aggregation could be critical. They argued, therefore, against

building the pipeline along the Coastal Route through the calving grounds. If the pipeline is to be built, most thought it should follow the Interior Route. But they were not unanimous. Dr. Frank Banfield, a consultant to Arctic Gas, said that the animals are, in fact, more vulnerable on their winter range, when they are widely dispersed foraging for food in the snow. He thought that pipeline construction during the winter along the Interior Route, through the midst of the herd's winter range, would disturb the herd when the pregnant females are vulnerable. He thought that a pipeline should be built along the Coastal Route.

The crux of the dispute among the experts centres on the question, which is more important to the caribou, their limited calving grounds or their vast winter range? The calving grounds cover about 4,000 square miles on the coastal plain; the winter range covers about 60,000 square miles.

I think the calving grounds are absolutely vital to the herd during the calving season, and interference with the herd at that time and at that place must be avoided. Caribou are more sensitive to disturbance when they are calving and immediately afterward than they are at other times of the year. Disturbance could prevent or delay movement of pregnant cows to the calving grounds, forcing them to calve in unsuitable areas where predation or other factors may cause a very high loss of newborn calves. The first 24 hours of the calf's life are crucial: it is then the cow and the calf learn to know one another, so that when they join the herd of thousands of animals they will be able to find each other. The females seem to require a short sedentary period to learn to recognize their calves. When the herds are disturbed, females and young are frequently separated. For example, a helicopter forced by fog to fly

low across the calving grounds would be a serious disturbance to the caribou — and fog is common along the north coast. A single such flight could cause the loss of many calves.

Once the calves begin to nurse, the cows join together in small groups and, when the mosquito season arrives, the herd gathers to limit the impact of these insects. The animals are thin when they arrive on the coast in June, but they are sleek and fat by the end of August. The herd is under great stress after calving, for mosquitoes and other insects attack them relentlessly. At this time, also, the animals' energy demands for nursing and for antler growth are at their maximum. The greatest loss of calves occurs at this season, and the herd may go for several years before enough calves survive to replace the natural losses among the adults, but over the years the delicate balance of the herd is maintained.

The Porcupine herd has not been subjected to any great slaughter since the days of whaling at the turn of the century, when significant numbers of caribou were killed every year to feed the crews overwintering on the Arctic coast. Today animals from this land are taken principally by native people from Old Crow, Aklavik and Fort McPherson in Canada and Kaktovik and Arctic Village in Alaska. Each of these communities takes some 500 animals each year, and the total annual kill is about 4,000 animals, a tolerable level given the present condition and size of the herd. But this picture is changing. The Dempster Highway now crosses part of the winter range of the herd, and already hunters on it may be taking 500 caribou annually. Obviously this new harvest will have to be watched with care.

Caribou are disturbed by any unfamiliar sight or noise. Low-flying aircraft may cause



the herd to run and even to stampede, frights that use up great amounts of energy. The animals are disturbed by people, machinery and sudden noises, such as blasting, and when these annoyances are repeated, they can be driven from their ranges. Dr. Peter Lent, a biologist from the University of Alaska, explained that the migratory barren-ground caribou is a wilderness species that can survive only in a wilderness where it has virtually untrammelled access to a vast range. Lent said that when other caribou populations have shrunk, they retreated from peripheral ranges, but they persisted in returning to the same calving grounds. He therefore urged the protection of the calving grounds and the post-calving area on the coast.

Dr. George Calef presented to the Inquiry an analysis of recorded changes in the size of various caribou herds during their contact with industrial man. The Fortymile herd used to roam the Yukon Territory and east central Alaska. In 1920, Olaus J. Murie estimated this herd to be 568,000 animals, but its population stands today at something like 6,000 animals. The Nelchina herd of Southeast Alaska consisted of 70,000 animals in 1962; by 1973, it had been reduced to only 8,000 animals. The Kaminuriak herd used to winter in Northern Manitoba. Although the Hudson Bay Railway, built in the late 1920s, crossed their winter range, the herd continued to use it for many years. By the early 1960s, however, the caribou had stopped crossing the railway, and they no longer foraged south of the Churchill River. The herd stood at 149,000 in 1955 and at 63,000 in 1967. Dr. David Klein has written about the gradual abandonment of ranges in Scandinavia by reindeer, after their migration routes had been interrupted by rail or highway traffic.

Calef said that there is not sufficient evidence to prove that the decline of any given herd can be attributed to the presence of man and his works. He was careful to say that we do not know exactly what caused the decline of these herds. Nonetheless, it is clear that a number of herds have abandoned parts of their ranges and they have decreased in numbers after they came in contact with industrial man. In my judgment the evidence, though circumstantial, is compelling. Increased access to the Porcupine herd and increased human and industrial activity can be expected to have major adverse impacts on the herd.

### *Coastal Route Impacts on Caribou*

More than 300 miles of the Coastal Route proposed by Arctic Gas lie within the range of the Porcupine caribou herd. Moreover, 200 miles of the route crosses the herd's principal calving range. Although only a small part of the herd winters near the Coastal Route during some years (for example, 5,000 animals wintered along the Arctic coast of the Yukon in 1974), most of the herd occupies ground along it during early summer. Each year, in May, June and July, virtually the whole herd moves onto the north slope for its migration to the calving grounds, the calving itself, the post-calving aggregation, and the post-calving migration. The massed herd is highly vulnerable to disturbance throughout these stages of its annual cycle.

The Arctic Gas proposal is to build this section of the pipeline in winter, when there are normally few if any caribou in the area; to cease work if caribou approach any area of pipeline construction; to limit and control

construction-related activities and operational or maintenance activities in the summer, when caribou are in the area; to control the altitude of aircraft over caribou; and to prevent construction personnel from hunting. On the basis of these elements of the proposal, both of the wildlife consultants retained by Arctic Gas, Banfield and Ronald Jakimchuk, testified that the project will not have a significant impact on the Porcupine caribou herd. This must be considered an optimistic view of the project.

Notwithstanding the emphasis on winter construction, there will be summer activities at wharves and stockpile sites along the coast, barge activity, traffic on roads, construction at compressor and camp sites, aircraft and helicopter flights and many related activities as well as workers moving about in construction areas and probably elsewhere. After completion of the pipeline, some of these summer activities would continue; there would be compressor and other noises peculiar to pipeline operation; and there may be summer maintenance or repairs. It is worth noting that the time of maximum concern for caribou along the Coastal Route — the calving and post-calving period — coincides with the time of snow melt and river break-up, when the pipeline will need to be checked frequently and when emergency repairs may be required. The United States Department of the Interior, in reviewing concerns over the impact of the Arctic Gas project on the calving herd, in the context of the measures proposed by Arctic Gas to mitigate these impacts, concluded:

Increased access, disturbance by aircraft and ground vehicles on the calving ground, summer borrow activities, and shipping activities all will act adversely on the herd. Disturbance



Arctic Gas' environmental panel (background) at the formal hearings, Yellowknife. (T. Chretien)

Caribou cows and calves. (ISL—G. Calef)

Caribou crossing Porcupine River. (G. Calef)

Caribou carcasses on the bank of Porcupine River near Old Crow. (G. Calef)



factors associated with material staging, construction, and operation of the compressor stations will add to the adverse, long-term impact on the herd. It is probable that these impacts will result in some reduction in herd numbers. If the animals abandon the traditional calving grounds and portions of their summer range, a major reduction (more than 50 percent) in herd size could result. [Final Environmental Impact Statement, Alaska Volume, p. 421]

Arctic Gas have assumed that all of their construction plans and schedules will be met, and that no activities planned for winter will spill over into the calving and post-calving period. But the Inquiry also heard a great deal of testimony about possible delays in construction scheduling on the north slope caused by snow road problems and by worker productivity problems in the dark and extreme cold. Any delays of this nature would increase work pressures at the end of the construction season, with the likelihood that certain activities would be carried over into the period when the calving herd has reached the north slope. Moreover, it could become necessary to transfer some activities from winter to summer, with associated increases in summer movements of men, machinery and aircraft, and consequent increases in impact on the herd.

In view of the above, I cannot share the opinion of Arctic Gas and their consultants that the gas pipeline along the Coastal Route would have little detrimental effect on the Porcupine caribou herd. Rather, it is clear that the pipeline could have highly adverse effects on the caribou during the calving and post-calving period. Thus, it is not surprising that the caribou biologists — except for those retained by Arctic Gas — have taken the position that no pipeline should be built along the Coastal Route through the calving grounds.

The case made by Arctic Gas in favour of the Coastal Route, and the support of this case by their biological consultants (except for Dr. William Gunn, their ornithological consultant), is based upon a consideration of the pipeline in isolation from other corridor developments. In fact, Jakimchuk said that he would not countenance an oil pipeline along either the Coastal Route or the Interior Route. But we cannot consider the gas pipeline in isolation; rather we must consider the pipeline together with the other developments that can be expected to follow it along the energy corridor.

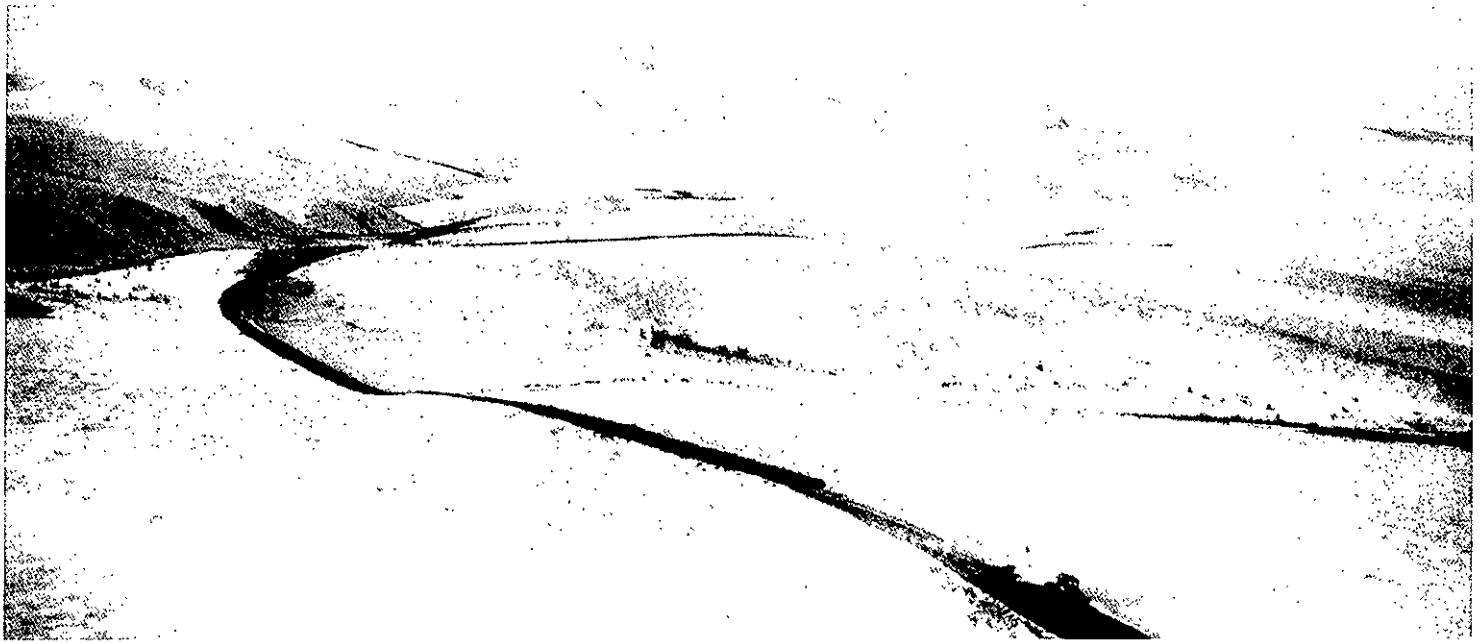
It is really not practical to say that the gas pipeline should be approved, but that no other development should be permitted later. Construction of the gas pipeline would probably be followed by looping of the gas line, construction of an oil pipeline, and a road or roads to service the oil pipeline and perhaps the other developments. Approval of the initial development by Canada and the United States would spur petroleum exploration on the coastal plain and the adjacent offshore region, which could lead to development of producing fields feeding into the energy corridor. These activities could not fail to aggravate the adverse impact on the calving herd that has been postulated above for the gas pipeline alone. Each new development in the corridor would bring additional workers, aircraft, barge traffic, vehicles, machinery, and destruction of habitat. Disturbance would inevitably increase during the calving period. Multiple facilities would be much more likely to deflect migratory caribou than a single buried gas pipeline, even though overpasses and underpasses might be provided at intervals along above-ground structures. An oil pipeline would be elevated for part or all of

its length across the Northern Yukon, as would feeder lines from producing wells.

What would be the effect on the Porcupine caribou herd of these multiple and sequential developments taking place on the calving grounds? The effect certainly would be much more severe than that of the gas pipeline alone, which the United States Department of the Interior concluded could cause a "major reduction (more than 50 percent) in herd size," should the animals "abandon the traditional calving grounds and portions of their summer range." [op. cit., p. 421] The evidence brought before me concerning decreases in the population of various caribou herds following the entry of industrial activity into their range is complex and circumstantial, but I find it compelling. I think it is likely that industrial development in the coastal calving and post-calving grounds would reduce the Porcupine caribou herd to a remnant.

### *Interior Route Impacts on Caribou*

Throughout most of its length from Prudhoe Bay to the eastern border of the Yukon Territory, the proposed Interior Route traverses ranges used by the Porcupine caribou herd during winter and during the spring and fall migrations. Thus, caribou are found at various places along the proposed route from August until early March. Construction during winter, as proposed by Arctic Gas, would encounter caribou not only during winter but also during the early stages of their northward spring migration in April and early May. Such encounters would occur not only along the route itself but also along the long access roads that Arctic Gas propose to build to transport pipe,



fuel and other supplies required for construction. Three such roads in the Yukon would connect the pipeline route to the Dempster Highway.

Construction and operation of the gas pipeline along the Interior Route could have impacts on caribou caused by the presence of people, operation of machinery and vehicles, aircraft noise, and destruction of habitat by fire. Migrating caribou could be deflected from their normal migration routes by construction or other activities along the pipeline or access roads, and, in the absence of disturbing activities, caribou might follow the cleared right-of-way or roads. These departures from normal migration patterns could have adverse effects on the herd itself, and could cause difficulty for the native people who hunt the caribou according to their traditional migration patterns. A gas pipeline along the Interior Route and access routes from the Dempster Highway to the pipeline would open up to hunters from outside the area large parts of the fall and winter range of the Porcupine herd that are now accessible only to the people of Old Crow. If there were a substantial increase in the number of caribou killed by outsiders, caribou harvesting by the Old Crow people could be affected and, over the long term, the overall size of the herd could be reduced.

In the paragraphs above, I have considered the potential effect of a gas pipeline on the Porcupine caribou herd along the Interior Route, but, as in the case of the Coastal Route, we should not consider the gas pipeline in isolation. We are bound to consider the cumulative impact of the gas pipeline, the looping of the gas pipeline, an oil pipeline and probably a road or roads. A gas pipeline along the Interior Route would also spur petroleum exploration (perhaps leading to production) in the Eagle Plains part of the

herd's range, and would lead to pressure on the government to permit exploration in the Old Crow Flats. This complex of industrial development, even if it were kept under the strictest control, would magnify many times the adverse effects on the Porcupine herd.

What then are the implications of the Interior Route for the caribou? We have seen that combined pipeline and corridor development along the Coastal Route would have a devastating impact on the whole herd by causing disturbance during the calving and post-calving periods. I have reviewed the arguments of the biologists that the caribou are less vulnerable in winter and along the Interior Route, but have noted Banfield's statement on the importance of overwintering conditions in maintaining the caribou population and Jakimchuk's conclusion that "the migratory periods are the most vital elements in the life cycle of the barren-ground caribou, the weakest link in the chain." [F13480]

Taking all the evidence into consideration, I think that a gas pipeline by itself along the Interior Route would not drastically reduce the herd, and that carefully controlled development along the Interior Route would have a less severe effect on the herd than development along the Coastal Route. Nonetheless, the cumulative effect of multiple facilities following the initial gas pipeline along an interior energy corridor, combined with the effect of the Dempster Highway, would undoubtedly be highly detrimental to the herd. It could substantially reduce the herd's numbers and, of course, it would undermine the caribou-based economy of the Old Crow people.

### *Dempster Highway Impacts on Caribou*

Upon completion, the Dempster Highway will connect Mackenzie Delta and Dawson City in the Yukon. It crosses the wintering grounds and migration routes of the Porcupine caribou, and this, it is said, represents a great threat to the herd. In determining the impact of a pipeline along either route, and in recommending terms and conditions to ameliorate its impact, we must consider the impact of the Dempster Highway as well.

The highway passes through more than 250 miles of caribou winter range. During migration, the highway and its traffic could deflect the animals from their normal migration routes or disrupt their normal migration schedule. Migrating caribou are subject to disturbance by men and machines. To a degree, they can tolerate the close presence of men, if they have not learned to associate men with harassment and injury. We know from experience at Prudhoe Bay and elsewhere that caribou in small groups can become used to vehicular traffic. In general, however, any road along which vehicles pass frequently is almost impassable for herds of caribou. The Dempster Highway will form a barrier to passage of the herd and, much more important, it will increase the access to the herd by hunters. With regard to the Dempster Highway, Jakimchuk said:

I feel that there is a distinct threat to the Porcupine herd. This threat constitutes human access through their winter range and through one of their major spring migration routes. [F14326ff.]

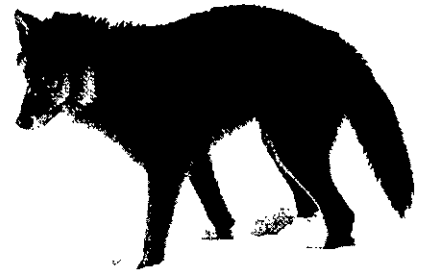
At present, only about 4,000 animals are taken by hunting each year from the Porcupine caribou herd in the Yukon and Alaska. This is a tolerable level. But unrestricted

Dempster Highway construction. (J. Inglis)

Muskrat feeding. (CWS)

Wolverine. (NFB-Hoffman)

Timber wolf. (C. & M. Hampson)



access for other hunters via the Dempster Highway would lead to intolerable pressure on the herd. Jakimchuk and other biologists highlighted the need to develop and implement controls over hunting along the highway to avoid this threat to the herd. Such controls are needed, not only along the highway itself, but also on hunting from winter roads, seismic lines and other access routes that have been and will be open to people travelling along the highway. The impact of the Dempster Highway can, I think, be limited, if appropriate measures are taken. I intend to set out my recommendations in that regard in Volume Two of this report. They will include restrictions on hunting along and near the highway.

The Dempster Highway is near completion, but Jakimchuk and Arctic Gas have estimated the impact of the gas pipeline on caribou without taking into account the impact of the completed highway. In my opinion, this is not realistic. The completed highway and its traffic, as well as hunting from it, will have placed the herd under stress before any pipeline is built. Therefore, a pipeline and an energy corridor along either the Coastal or the Interior Route would affect the herd already under pressure from the highway, not the herd as it exists now.

But the Dempster Highway's impact on the herd will be nothing like as great as that of a pipeline along the Coastal Route because the highway does not go near the calving grounds. It impinges on the winter range, but not in a way that is likely to deprive the animals of significant habitat. The herd can survive the loss of part of its wintering range, but it could not survive the loss of its calving grounds.

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## Other Environmental Concerns

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The most obvious and important environmental impacts of a pipeline and an energy corridor across the Northern Yukon would be on the Porcupine caribou herd and on the fall staging snow geese. But, the overall effect of the proposed pipeline and corridor would involve virtually all components of the environment — birds, mammals, fish, and the landscape itself. These incremental effects taken together would bring about fundamental changes in the ecosystem, destroy the wilderness character of the region, reduce the populations of some species, and reduce the potential harvest of renewable resources. Some of these effects would be greater along one route than the other, and some would affect both routes equally.

### Mammals

Various mammal populations, in addition to the Porcupine caribou herd, would decline as a consequence of pipeline and energy corridor development. The grizzly bear population and the small wolverine population, for instance, may be expected to decline following human encroachment on their ranges along either route. Wolves would be more vulnerable in the tundra region along the Coastal Route than in the forest. Polar bears occur only along the coast, and would be adversely affected by development there. Dall sheep would be affected along the Interior Route where it passes through the Brooks Range in Alaska and also along the Coastal/Circum-Delta Route where it skirts the base of Mount Goodenough. Muskrats

are not highly susceptible to the kinds of disturbance associated with a gas pipeline and an energy corridor, but a pipeline along the Interior Route close to the Old Crow Flats could cause short-term decreases in the muskrat population in some parts of the Flats, and some disruption of muskrat harvesting by the Old Crow people.

### Fish

The Inquiry heard extensive testimony regarding the serious disturbance to local fish populations (particularly arctic char) that would accompany pipeline construction along the Coastal Route. Removal of water from streams and lakes during winter would harm overwintering fish or eggs. Moreover, winter construction of river crossings and the growth of a frost bulb around pipe buried under a riverbed may impede the flow of water into ponds used by overwintering fish. Gravel removal from river channels would be a hazard to spawning and migration of fish.

These and similar impacts can be limited through remedial or ameliorative measures, but uncertainties over adherence to construction schedules and over plans for snow roads leave in doubt the effectiveness of such measures. Even under well-regulated conditions, construction along the north slope might damage fish populations overwintering in confined spring-fed pools by a lowered water level, siltation, chemical pollution (for example, fuel spills) and increased fishing. The development of an energy corridor with an oil pipeline, a road, and perhaps other facilities, would greatly increase these hazards. Thus Dr. Norman Wilimovsky, of the Environment Protection Board, told the Inquiry that:

in carrying out an impact assessment of the

aquatic environment, one must plan for the greatest impact ... [and] if one rates a gas pipeline as one level of danger, an oil pipeline would be three to five times greater, and in my estimation, a road six to ten times more dangerous than an oil pipeline. [F6168]

The consensus of the biologists who appeared before the Inquiry was that a gas pipeline along the Interior Route in Canada would be a greater threat to fish than a gas pipeline along the Coastal Route because of the diversity of fish in the Porcupine River drainage, the importance of fish to the Old Crow people, and the international importance of the Porcupine River salmon runs. These risks would be multiplied many times if an oil pipeline or a road or both followed the same general route.

### Birds

Both the Coastal and Interior Routes have the potential for major impacts on birds, but the magnitude and number of anticipated impacts are greater along the Coastal Route because it crosses an area of critical importance for migratory birds. There is a special concern for the fall staging snow geese on the Coastal Route, which will be discussed more fully below.

Among the many species of birds that summer along the pipeline route in the Northern Yukon, two groups are of particular concern. The first group includes species that are rare and relatively rare, especially birds of prey such as the peregrine falcon and the golden eagle. Birds of prey nest along both routes, and along any other route that could be chosen across the Northern Yukon, but impact on them appears likely to be greater along the Interior Route.

The second group includes populations of waterfowl, which congregate in large flocks in relatively confined areas or within limited

ranges during some critical parts of their life cycle. Such concentrated populations are found on the Old Crow Flats, north of the Interior Route, and along the full length of the Coastal Route in the Yukon and Alaska.

Old Crow Flats are a waterfowl-production area of continental importance, with breeding populations of ducks of up to 170,000. Fortunately, the Interior Route avoids this critical area but the bird populations could still be adversely affected by frequent aircraft overflights at low level, increased human access, fuel spills into creeks that drain into the Flats, and exploration activities. If an oil pipeline follows the gas pipeline, a pipe failure could cause oil to leak into the Old Crow Flats and become a very serious threat to these large populations of migratory waterfowl.

The coastal plain of the Yukon and Alaska is an important nesting and moulting area for ducks, geese, swans, loons and various shorebirds. It is the fall staging area for snow geese, which in some years number in the hundreds of thousands. The nearshore waters are used for moulting by thousands of ducks, and the coastal area in general serves as a migration corridor, both eastward and westward, for millions of waterfowl and shorebirds.

Although Arctic Gas propose to carry out their main construction activities along the Coastal Route in winter, when there are few birds in the area, they cannot eliminate all concern for the project's impact on birds. During summer, in the construction period, there will be aircraft and barge movements; activities at the coastal stockpile sites, compressor sites and airfields; and perhaps gravel operations and other activities along the pipeline route. During operation of the pipeline, there will be noise from compressors and from blow-down, aircraft and barge

movement, vehicles, and probably repair and maintenance work. During both construction and operation, fuel could be spilled into coastal waters from onshore storage tanks or from barges or barge-unloading. The birds could be adversely affected if the lakes they use for nesting and feeding are contaminated or made turbid, or if the removal of water from them during winter for snow roads or pipe testing caused lower water levels to persist into the summer. Finally, there could be physical disturbance of the coastal beaches, bars and spits that are of critical importance to the birds.

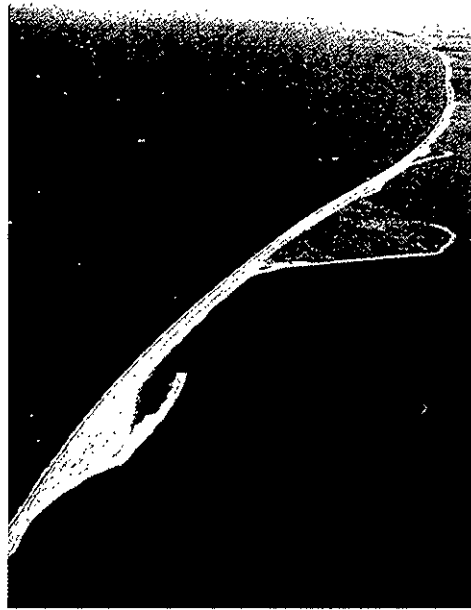
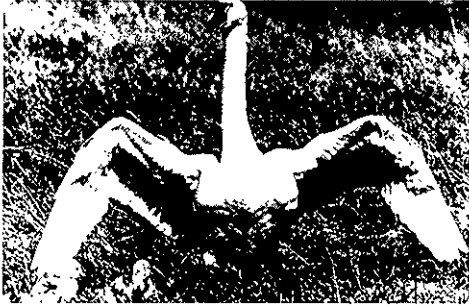
Arctic Gas have proposed various measures to reduce or to avoid adverse impacts on birds, and Volume Two of this report will recommend measures to protect bird populations. Nonetheless, adverse effects on them would be an inevitable complement to a gas pipeline on the Coastal Route. Our basic concern for these birds, and our objective in protecting them, is to permit these international migratory populations to continue to use this region year after year without having their numbers progressively diminished. I have heard various opinions on whether or not the gas pipeline by itself would cause an unavoidable or substantial reduction in the bird populations that use the coast, but it is significant that all of the bird specialists would prefer that the pipeline should not follow the Coastal Route. And, if we consider the gas pipeline, not in isolation but as the first step in the development of an energy corridor along the Coastal Route, then it appears that the cumulative effect of these developments would inevitably lead to progressive decline in some bird populations.

Snow geese. (C. & M. Hampson)

Whistling swan protecting young.  
(C. & M. Hampson)

Yukon coast showing spits, islands and bays used  
by shorebirds and waterfowl. (I. MacNeil)

Newly hatched whistling swans. (C. & M. Hampson)



## The Northern Yukon

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### Snow Geese

In late August, great flocks of snow geese gather on the Yukon Coastal Plain, the adjacent coastal plain in Alaska, and the outer parts of the Mackenzie Delta. For about a month, they graze near the proposed Coastal Route, building up energy for their long southward flight. Disturbance of the birds during this highly critical period of energy build-up could mean that some of them, both juveniles and adults, might not have the stamina to complete their southward migration. In the long term, pipeline and corridor development could lead to decline of this internationally important goose population.

The lesser snow geese of the Pacific Flyway winter primarily in the Central Valley of California. In spring, they fly north to nest in large colonies in the western Canadian Arctic and on Wrangel Island off the coast of northeastern Siberia. The Pipeline Application Assessment Group has described the Canadian population of these geese as follows:

Each spring, thousands of birds return from their wintering areas in the southern United States by way of the Mackenzie River Valley. They require open water, and they rest, feed and mate on the partly flooded river islands and on nearby lakes after the break-up of the river ice. Their destinations are the few suitable nesting areas at the mouths of the Anderson and Smoke Rivers (Northwest Territories), Banks Island, and a few small scattered sites near the marine interface of the Mackenzie Delta. Snow geese are colonial nesters, returning each year to the same areas. Such areas have extensive brood-raising capabilities.

By mid-August the geese gather on the islands of the Delta in flocks of some 20,000 to 50,000 birds, totalling 500,000 in some years. They then fly westward to the North Slope of the Yukon Territory and Northeast Alaska.

Here they feed intensively on berries and sedges for four to six weeks to prepare themselves for the long migration to the wheat fields of southern Alberta and beyond. They usually fly non-stop the 800 miles between the North Slope and Hay Lake in northern Alberta. [*Mackenzie Valley Pipeline Assessment*, p. 296]

During their stay on the staging grounds, snow geese are highly sensitive to human presence, noise, and aircraft. Dr. William Gunn, an ornithological consultant to Arctic Gas, described to the Inquiry experiments to test the sensitivity of snow geese. In one such experiment, the geese would not feed any closer than 1.5 miles from a device simulating the noise made by a compressor station, and birds flying over it diverted their course by 90 degrees or more. Gunn also reported that snow geese are sensitive to the presence of aircraft and they show evidence of being disturbed by flushing at a mean distance of 1.6 miles from small aircraft, 2.5 miles from large aircraft, and 2.3 miles from small helicopters. They also flushed in response to aircraft flying at altitudes of 8,000 to 10,000 feet, the maximum height at which the test flights were conducted. Deliberate harassing of flocks of geese in an area approximately five miles by ten miles cleared them out of the area in 15 minutes.

On the basis of data on the rates of disturbance at a time when the birds, especially the juveniles, needed to build up their energy reserves for migration, Gunn concluded that a potentially severe problem could arise if the present frequency of aircraft flights in the region were to double.

Jerald Jacobson, in Volume 4 of the *Environmental Impact Assessment* published in 1974 by the Environment Protection Board, generalized the available information on the response of snow geese to various human and industrial activities, and he

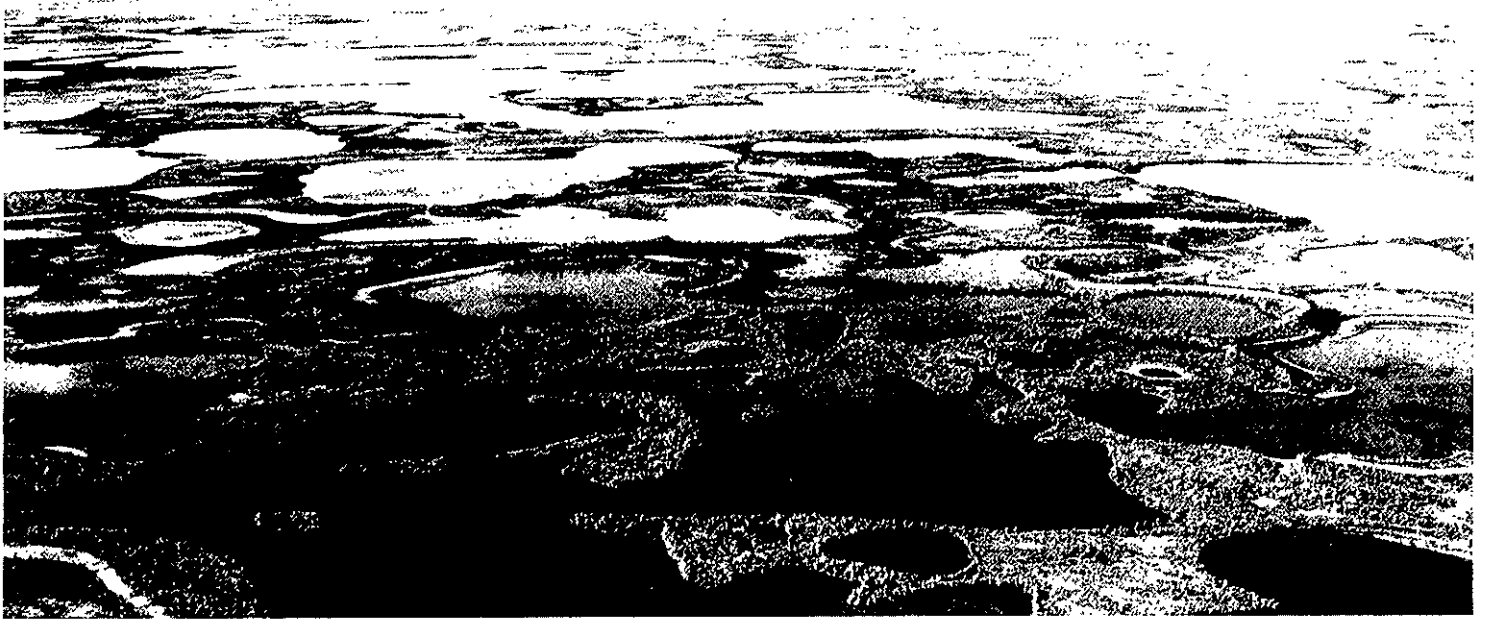
inferred that geese may avoid an area as large as 20 square miles around an operating drill rig, 28 square miles around an operating compressor station, and 250 square miles around an airstrip during takeoff and landing of aircraft. He also drew the following conclusions regarding the effect of aircraft:

The use of airstrips and general operation of aircraft for construction and operation activities from 15 August to 15 October on the Yukon coast is a major conflict, and could seriously degrade or even destroy the integrity of the area for fall staging snow geese....

Because "There is no practical flight altitude that does not frighten snow geese" (Salter and Davis 1974b), unrestricted aircraft traffic on the Yukon coast from 15 August to 15 October could be expected to disturb snow geese on 100 percent of the staging area. Any increase in aircraft traffic will result in increased disturbance to snow geese and reduce the suitability of the area up to some unknown threshold level, when it may become unacceptable to fall staging snow geese. There are no data available on the cumulative and long-term effects of aircraft disturbance to snow geese, or on their accommodation to aircraft disturbance during this stage of their life cycle. [p. 139]

Of course, Arctic Gas propose to schedule their principal construction activities in winter after the geese have flown south, and to restrict noisy activities during both construction and operation of the pipeline when the geese are feeding before going south. Nevertheless, aircraft flights, shipping, activities at wharf and storage sites and construction at camp and compressor sites appear to be inevitable during the construction phase even when the geese are on their staging grounds. Similar potentially disturbing activities at this season would take place throughout the operating life of the pipeline.

The gas pipeline's impact on the fall staging snow geese would not be limited to



the Yukon and Alaska Coastal Plain. If the Arctic Gas Cross-Delta Route is followed, the impact would spread to the outer parts of the Mackenzie Delta that are used by fall staging snow geese. Particular concern has been expressed before the Inquiry over construction activities at the Shallow Bay and other Delta channel crossings during this season. They include the effects of shipping, aircraft and especially hovercraft noise, the effects of waterborne fuel spills on the wetlands in the Delta, and the effects of a compressor station or other long-term facilities on the outer Delta.

After considering these potential effects on the fall staging snow geese and the measures proposed by Arctic Gas to mitigate them, the United States Department of the Interior concluded:

the entire population of snow geese could be adversely affected if repeated aircraft flights, such as might be expected with a major repair of the pipeline system, were required to cross critical staging habitat areas while geese are present. [p. 284]

Snow geese, while on the fall staging and feeding areas, will be affected more than other geese species. If disturbance is severe and long-term, it could cause the geese to seek other less suitable areas for staging and feeding. In any case, the population of snow geese will be reduced. [Final Environmental Impact Statement, Alaska Volume, p. 422]

This forecast is based on the assumption that Arctic Gas would build a pipeline in the manner and following the schedule at present proposed by the company, and it considers the gas pipeline in isolation from other developments. My assessment of impact cannot be based on these premises. The possibility that Arctic Gas will have to modify their plans and schedules is discussed in another chapter of this report, and I have already explained why I am forced to

look at the gas pipeline as the trigger for multiple developments along an energy transportation corridor.

What would be the effect on the snow geese of the pipeline, the energy corridor, and related industrial development throughout their fall-staging grounds? These disturbances would inevitably involve a progressive increase in the numbers of people, of aircraft, barge and vehicle movement, and machinery noise. From the evidence before me, it appears that this population of snow geese would certainly dwindle, and it could decline drastically if the stresses imposed by industrial development on their fall staging grounds were continued through a succession of years when spring was late or snow came early.

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## A National Wilderness Park for the Northern Yukon

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The Northern Yukon has been described by Dr. George Calef as:

... a land richer in wildlife, in variety of landscape and vegetation, and in archaeological value than any other in the Canadian Arctic. Here high mountains, spruce forests, tundra, wide "flats" of lakes and ponds, majestic valleys. ... and the arctic seacoast come together to form the living fabric of the arctic wilderness. Altogether there are nine million acres of spectacular land in its natural state, inhabited by thriving populations of northern plants and animals including some species which are in serious danger elsewhere. [The Urgent Need for a Canadian Arctic Wildlife Range, p. 1]

If this unique area of wilderness and its wildlife are to be protected, the Arctic Gas pipeline should not be built across the Northern Yukon. The region should not be

open to any other future proposal to transport energy across it, or to oil and gas exploration and development in general. This summarizes my approach in the earlier parts of this chapter. But now we must go further. It seems to me that, if this kind of protection of the land, the environment and the people is to be effective, the Northern Yukon must be formally designated as an area in which industrial development of any kind is to be totally and permanently excluded. I therefore urge the Government of Canada to reserve the Northern Yukon as a wilderness park.

The park that I propose for the Northern Yukon should be set up under the National Parks system, but it would be a new kind of park — a wilderness park. It would afford absolute protection to wilderness and the environment by excluding all industrial activity within it. Of course there would have to be guarantees permitting the native people to continue to live and to carry on their traditional activities within the park without interference. In my opinion, there should be an immediate withdrawal of the land and water areas needed for this park, which could be effected by designating it as a land reserve under Section 19(c) of the Territorial Lands Act. This action would serve as a clear indication of intent and as the starting point for the planning of the park and negotiations with the United States regarding its relationship to the Arctic National Wildlife Range in Alaska.

The wilderness park that I am proposing would comprise all land between the Alaska-Yukon border and the Yukon-Northwest Territories border from the Porcupine River northward to the coast, including Herschel Island and all other islands adjoining the coast. Its northern boundary would be three miles offshore. This park

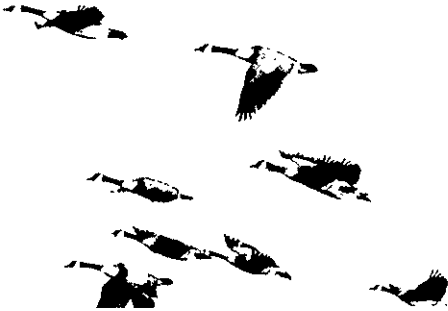


Old Crow Flats. (I. MacNeil)

Canada geese. (C. & M. Hampson)

Grizzly bear. (C. & M. Hampson)

Bald eagle. (NFB-Cognac)



## The Northern Yukon

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would cover approximately the same area as the Canadian part of the proposed International Wildlife Range, and would adjoin the Arctic National Wildlife Range in Alaska.

The size and boundaries of the proposed park would protect important habitats of migrating birds, the Porcupine caribou herd, and various other mammals; they would also protect the most important hunting and trapping areas of the Old Crow people and the unique wilderness area of the Northern Yukon. The park would include the Yukon Coastal Plain and the Old Crow Flats. The Canadian sector of the Porcupine caribou herd's spring and summer range and the critically important calving range of the herd would lie within it. But the area represents a compromise: the main wintering range of the caribou herd lies south of the Porcupine River and south of the proposed wilderness park. The Dempster Highway and extensive oil and gas exploration on the Eagle Plains render this part of their winter range unsuitable for reservation as a wilderness area.

The proposal to establish a wilderness park is entirely in keeping with the priorities for the North set out in the *Statement of the Government of Canada on Northern Development in the 70's*:

To maintain and enhance the natural environment, through such means as intensifying ecological research, establishing national parks, ensuring wildlife conservation. [p. 29]

It is also consistent with the policy laid down by the Pipeline Guidelines. Corridor Guideline No. 4 reads as follows:

In relation to the pipeline corridors ... the Government will identify geographic areas of specific environmental and social concern or sensitivity, areas in which it will impose specific restrictions concerning route or pipeline activities, and possibly areas excluded from pipeline construction. These concerns

and restrictions will pertain to fishing, hunting, and trapping areas, potential recreation areas, ecologically sensitive areas, hazardous terrain conditions, construction material sources, and other similar matters. [p. 11]

## Wildlife Range in Alaska

The wilderness does not stop, of course, at the boundary between Alaska and the Yukon. The northeast part of Alaska, contiguous to the Northern Yukon, is a part of the same wilderness. In fact, the calving grounds of the Porcupine caribou herd extend well into Alaska, along the coastal plain as far as Camden Bay, 100 miles to the west of the international boundary; the area of concentrated use by staging snow geese, by nesting and moulting waterfowl and by seabirds also extends far into Alaska.

So a wilderness park in the Northern Yukon would not, by itself, altogether protect the caribou herd and the migratory birds. We shall need the cooperation of the United States to ensure complete protection for the herd. But I believe that cooperation will be forthcoming, for the United States is, in fact, well ahead of us in protection of the herd. A movement to protect the eastern section of the north slope and the Brooks Range began in Alaska during the 1920s. In 1960, the Secretary of the Interior issued a Public Land Order to establish the Arctic National Wildlife Range, under authority delegated by Executive Order 10355. This is a land withdrawal mechanism remarkably similar to that available to the Minister of Indian Affairs and Northern Development under Section 19 of the Territorial Lands Act. The eastern edge of the Arctic National Wildlife Range borders on the Yukon, a political, not an ecological boundary.

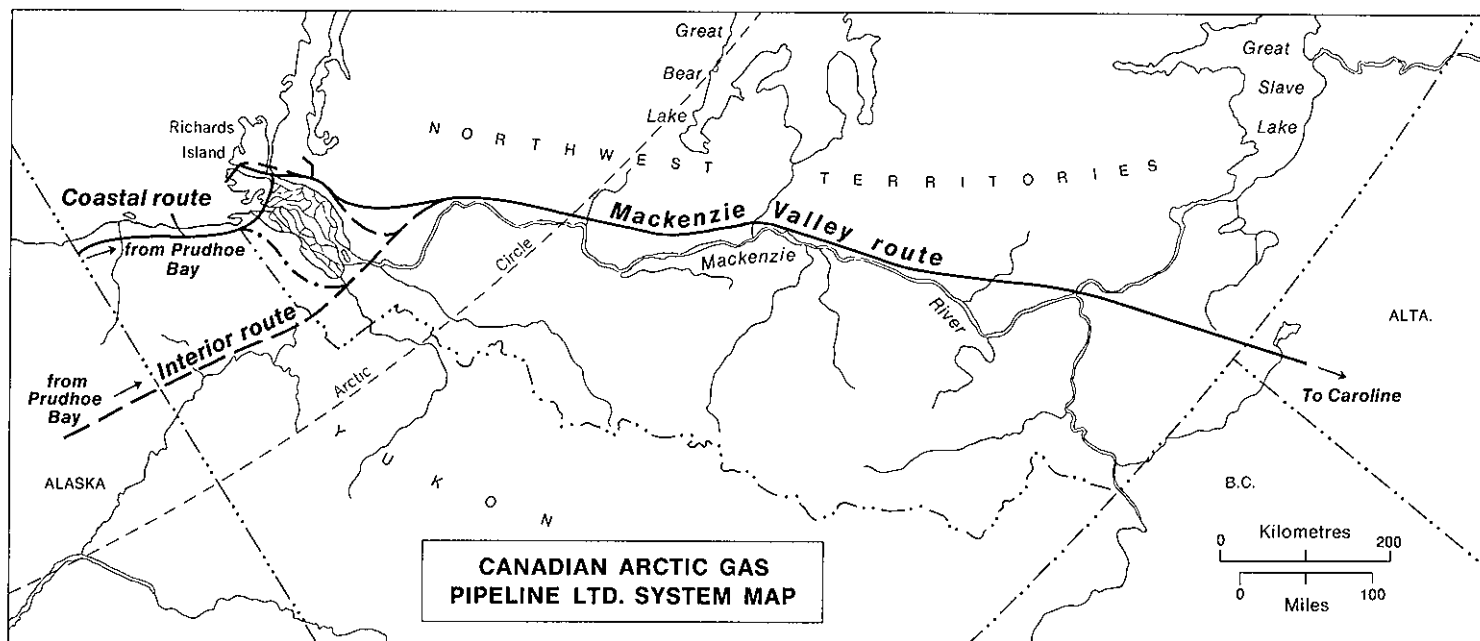
The movement to include this range in the

United States National Wilderness Preservation System continues. The range, as established in 1960, is within a land use category less restrictive than a national park. In 1972, 8.8 of its 8.9 million acres was recommended for inclusion in the United States National Wilderness Preservation System and, more recently, Senate Bill 2917 provided for more than 80 million acres of conservation lands in Alaska, including a 3.76 million-acre extension of the Arctic National Wildlife Range. Although these proposals have not yet been acted upon, they reflect a view, widely held in the United States, that it would be in the public interest to designate the Range as wilderness.

Dr. Robert Weeden, a biologist from Alaska, says that if no pipeline is built, and no oil and gas development occurs, the Arctic National Wildlife Range will serve as an ecological reserve and as an ecological base from which to monitor changes brought about by future developments in Alaska. But the existing Arctic National Wildlife Range is not inviolate to oil and gas exploration and development. If the wilderness, the caribou herd and the snow geese on the Alaskan side of the border are to be protected, the Range must be elevated to wilderness status.

## International Wildlife Range

The international movements of caribou, waterfowl, bears and other animals have led, of course, to consideration of a wildlife range in the Northern Yukon to adjoin and complement the wildlife range in Alaska. Impetus for an Arctic International Wildlife Range came from a conference of conservationists in Whitehorse in October 1970. The conference submitted a resolution to the Governments of Canada and of the Yukon Territory



for the establishment of an "Arctic International Wildlife Range, (Canada)." The Honourable Jean Chrétien, then Minister of Indian Affairs and Northern Development, endorsed the action of the conference and promised to support it. In June 1971 the Arctic International Wildlife Range (Canada) Society was formed. The proposal for an International Range has been endorsed by the Canadian Wildlife Federation, the International Union for Conservation of Nature and Natural Resources, and the Environment Protection Board. Many witnesses spoke to the Inquiry in favour of an Arctic International Wildlife Range, consisting of a major portion of the Northern Yukon and the existing Alaskan Wildlife Range.

The wilderness park that I am proposing here would cover approximately the same area as the Canadian part of the proposed Arctic International Wildlife Range, and it would adjoin the nine-million acre Arctic National Wildlife Range in Alaska established to protect its unique wildlife, wilderness and recreational values. Together, these two areas would constitute a magnificent area of 18 million acres spanning the international boundary, an area large enough to provide for the long-term well-being of its wildlife, and especially of the Porcupine caribou herd and the snow geese. It would be one of the largest wilderness areas in the world.

There is a precedent in the Glacier-Waterton International Peace Park in Alberta-Montana. Management of major trans-boundary resources such as the Porcupine caribou herd might require formal international agreements instead of the informal cooperation that now works so well in Glacier-Waterton Park, where trans-boundary movements of the populations are not significant.

A pipeline across the Northern Yukon would not only destroy the possibility of establishing a true wilderness park there, but it would undermine efforts in the United States to convert the Arctic National Wildlife Range to wilderness status. Weeden, speaking for the State of Alaska, said:

The State has taken the position that such an intrusion upon an untouched area is irreversible and tragic, whatever steps are taken to mitigate its effects. [F7545]

The largest wildlife refuge in the United States would be in jeopardy and the possibility of combining it with a Canadian range to form one of the largest wildlife refuges in the world would be thwarted.

### Oil and Gas Potential

If we create a wilderness park in the Northern Yukon, shall we be denying ourselves indispensable supplies of gas and oil? Will it become necessary, in any event, to invade this wilderness? No one can say for sure, but no evidence brought before me indicated or even suggested that the Northern Yukon is a first-priority oil-and-gas province. There has been extensive exploratory drilling east of it in the Mackenzie Delta area and west of it in Alaska. In these areas, the coastal plain and the offshore continental shelf are considerably wider than they are in the Yukon. The zone of potential oil and gas exploration along the north coast of the Yukon is narrow, and the area has not achieved any prominence in exploration strategy so far. It is also noteworthy that the three deep exploratory test wells drilled near the Yukon coast were dry.

### Native People and the Wilderness Park

My proposal for a wilderness park is specifically designed to benefit the native people by protecting their renewable resources and by preserving the land in its natural state, thus ensuring the physical basis for their way of life. This benefit extends to the Old Crow people, who live within the area of the proposed park, the Indians from Fort McPherson and Aklavik, who hunt in the eastern part of the proposed park, and the Inuit, largely from Aklavik, who hunt and fish along the Yukon coast. All of these people depend on the Porcupine caribou herd, the protection of which is one of the principal purposes of the proposed park.

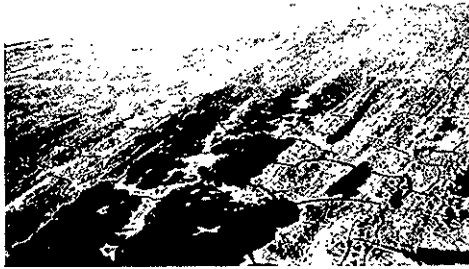
The rights that the native people of Old Crow and the Mackenzie Delta would enjoy throughout the area covered by the park would have to be negotiated between the Government of Canada and themselves as part of a comprehensive settlement of native claims, but I do not think the dedication now of the Northern Yukon as a park would prejudice those claims.

Preservation of the wilderness and of the caribou herd is plainly in keeping with the desires of the native people. But, there are certain essential conditions that would have to be observed: the native people must be guaranteed at the outset their right to live, hunt, trap and fish within the park, and to take caribou within its boundaries; and the people of Old Crow must play an important part in the management of the park and, in particular, of the caribou herd. It is my judgment that the establishment of the park and of a management plan in cooperation with the native people, building both upon their knowledge and experience and that of the scientists who have studied the caribou

Phillips Bay, Yukon coast; breeding and staging area for waterfowl. (I. MacNeil)

Porcupine River. (ISL—G. Calef)

Alaska North Slope. (ISL—G. Calef)



and the Northern Yukon biota, can be consistent with and complementary to these principles.

We have already some experience in the establishment and management of parks (although not wilderness parks) in the North and have seen their effects on the interests of the native people. At Nahanni Butte the Inquiry was told that the Dene play no part in the management of the South Nahanni National Park. This experience must not be repeated in the wilderness park for the Northern Yukon that I am urging upon the Government of Canada. The conditions I have outlined will, in my judgment, avoid such a repetition and will avoid prejudice to native claims.

In *Runes of the North*, Sigurd Olson, an American naturalist, wrote:

It may well be that with [the help of the native people] the Canadian north, with its vast expanses of primeval country, can restore to modern man a semblance of balance and completeness. In the long run, these last wild regions of the continent might be worth far more to North Americans from a recreational and spiritual standpoint than through industrial exploitation. [p. 156]

It may be said that no one will visit the park because it is too remote. Only the wealthy, it may be argued, will have the opportunity to see the caribou and to enjoy the solitude and the scenery. But Canadians of ordinary means and less are there now, enjoying these wonders of nature. I speak, of course, of the native people. Is that not enough? Canadians from the provinces do not have to visit the wilderness or see the herd of caribou to confirm its existence or to justify its retention. The point I am making here is that the preservation of the wilderness and its wildlife can be justified on the grounds of its importance to the native people. But the preservation of wilderness

can also be justified because it is there, an Arctic ecosystem, in which life forms are limited in number, and where, if we exterminate them, we impoverish the frontier, our knowledge of the frontier, and the variety and beauty of the earth's creatures.

## An Alternative Route Across the Yukon

I have recommended that no pipeline be built and no energy corridor be established across the Northern Yukon along either of the routes proposed by Arctic Gas. This means that, if gas from Prudhoe Bay and, subsequently, gas and oil from other sources in Alaska must pass overland to the Lower 48, the pipeline will have to be routed through the southern part of the Yukon Territory. The only overland route that has been seriously advanced as an alternative to the routes proposed by Arctic Gas is the Alaska Highway Route (also known as the Fairbanks Route) which is the route proposed for the Alcan Pipeline. This route would follow the trans-Alaska pipeline from Prudhoe Bay to Fairbanks, the Alaska Highway to the eastern border of Alaska and then cross the Southern Yukon into British Columbia and Alberta.

At Whitehorse, I heard evidence from Arctic Gas and from other participants in the Inquiry, comparing this route with the Coastal and Interior Routes. On the basis of that evidence, many of the concerns that led me to reject the pipeline routes across the Northern Yukon do not appear to apply to the Alaska Highway Route.

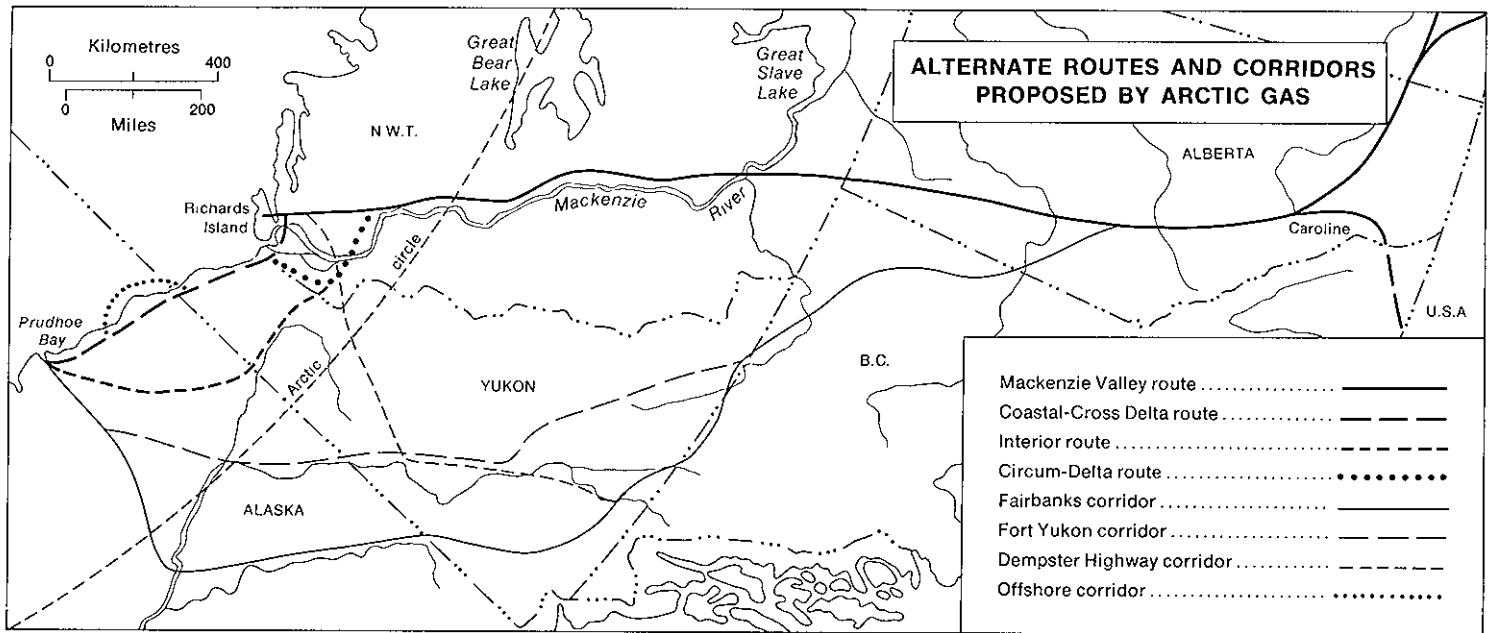
No major populations of any wildlife species appear to be threatened by the construction of a pipeline paralleling the

Alaska Highway, either in the Yukon or in Alaska. The route follows an existing corridor along the trans-Alaska pipeline north of Fairbanks and along the Alaska Highway south and east of Fairbanks. Like the trans-Alaska pipeline, this route would come into contact with only small numbers of caribou south of Prudhoe Bay. Elsewhere, although there are important wildlife populations in the area traversed by the proposed route, they apparently would not have major contact with the corridor.

The concerns that I have expressed about the scheduling and logistics of building a pipeline across the Northern Yukon would not apply (or would be much less important) if a pipeline were built along the Alaska Highway Route. The Arctic Gas pipeline would have to be built in the cold and darkness of winter north of the Arctic Circle, from a snow working surface. It would depend upon a limited shipping season, and a whole infrastructure would have to be established to bring in material, equipment and supplies. In contrast, a pipeline following the Alaska Highway Route in Canada could probably be built in either winter or summer, and it would cross an area with less extreme winter weather, and follow a main highway that has a short connection to the Pacific coast.

Within Canada, only short sections of the Alaska Highway Route would encounter permafrost, and the problems of pipeline construction and operation across permafrost and of controlling frost heave would be of little concern. Of course, permafrost does exist throughout most of the Alaska portion of this proposed route.

I have not examined the social and economic impact of a pipeline along the Alaska Highway Route. Neither have I considered the question of native claims in the Southern



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Yukon. The Council of Yukon Indians have advised that native claims must be settled in the Southern Yukon before any pipeline is built. These matters would be of fundamental importance in any decision to build a pipeline across the Southern Yukon and they must be assessed carefully before any recommendation is made for a pipeline along the Alaska Highway. Certainly, I am in no position to make such a recommendation.

If a decision should be made in favour of a pipeline along the Alaska Highway Route, or over any other southerly route across the Yukon Territory, I recommend that any agreement in this regard between Canada and the United States should include provisions to protect the Porcupine caribou herd and the wilderness of the Northern Yukon and Northeastern Alaska. By this agreement,

Canada should undertake to establish a wilderness park in the Northern Yukon and the United States should agree to accord wilderness status to its Arctic National Wildlife Range, thus creating a unique international wilderness park in the Arctic. It would be an important symbol of the dedication of our two countries to environmental as well as industrial goals.