Benefits from multiple-purpose rights-of-way in the interior of British Columbia 1985

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Virtually nothing has been said about the beneficial aspects of rights-of-way. Also overlooked, is that most developments are built by responsible organizations with continuing financial, social, and political obligations to both private and public investors.

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Introduction

In recent years, many projects have been planned or built which have involved the clearing and construction of new rights-of-way or the widening of existing rights-of-way. Most of these rights-of-way have been subjected to severe scrutiny by regulatory agencies and by environmental groups, protestors in general, and the various media at public hearings. Major projects like clearing of electric powerline and gas line rights-of-way, double tracking of the transcontinental railways, and construction of new highways have received unrelenting criticisms on the negative impacts to existing developments, natural resources, and unsubstantiated environmental values, and on native land claims.

The criticisms tend to group all rights-of-way into a common form of land use, regardless of their actual use and impacts. Rights-of-way for railroads and highways have single-purpose use because of the exclusive use of the ground surface. Rights-of-way for electric transmission lines and pipelines have multiple-purpose uses because the primary uses only monopolize the air space above or subsurface below ground level.

Virtually nothing has been said, printed, or proclaimed on the beneficial aspects of rights-of-way. Overlooked are the benefits which are derived from better transportation, higher land use, higher taxation base, alternate resource uses, and more reliable energy supplies. Also overlooked, is that most developments are built by responsible organizations with continuing financial, social, and political obligations to both private and public investors.

After participating in the British Columbia Utilities Commission hearings on the Vancouver Island Gas Pipeline Project, the Authors were aware of increasing criticism of rights-of-way in principle rather than in fact. Subsequently they visited private and public agencies to determine the underlying reasons for the criticisms in the most affected regions of the Interior of British Columbia from Williams Lake to Merritt.

Location of Major Rights-of-Way

The major railroads and highways, electric transmission lines, and oil and gas pipelines traverse the Province from east to west and north to south to terminals on the North Coast at Prince Rupert and on the South Coast at Vancouver. While to date, "common corridor" concepts have not been planned, the major transportation and utility rights-of-way have been routed in parallel and frequently common routes and rights-of-way, because of the constraints imposed by the limited accesses through the north-south orientation of the mountain ranges. Local geography and land uses have had little influence on the principal routing.

Most of the existing major rights-of-way pass through the Cariboo and Kamloops Forest Regions. Since these Regions have high multiple-use of land resources, they are selected for analyses of the impacts in this study.

Responsibilities of Developers

Planners and developers of rights-of-way have responsibilities which are usually overlooked by critics when only the visual and physical impacts are reviewed after construction.

Rights-of-way for electric power; gas, oil, and water pipelines; and transportation are designed to ensure minimal interruption of services. This minimal interruption is frequently associated with safety to both the structures and to the public and private users. Physical influences like snow and land slides, ero-

sion, ground stability, and other safety influences affect the location and widths of rights-of-way. When combined with the aesthetic needs of the land owners, both private and public, rights-of-way are usually the result of many compromises to influences beyond the purpose of the principal service or intent.

Complex regulations exist to protect the customers and shareholders of utilities to ensure that developments are built at lowest cost and least impact to other resources. While the objectives of such regulations are laudable in theory, the objectives often result in costly preconstruction reports and hearings, delayed start-ups, and more expensive construction projects. Frequently, the costs of the latter could be better spent mitigating negative impacts, if any, of a completed project.

Often, little cognizance is given to the fact that developers of major projects are usually responsible organizations. Such organizations have specifications and procedures for construction and environmental protection which have been successfully developed from field experiences on previous projects, dating back several decades.

Physical Impacts of Rights-of-Way on Land

Two main types of rights-of-way exist:

Single-purpose use:

for highways, roads, railroads, and narrow electric distribution lines in which the surface of the ground and air space are only available for single-use

Multiple-purpose use:

for pipelines and electric transmission lines in which the surface of the ground is available for agricultural and forest crops, grazing of cattle and wildlife, transportation, and recreation.

Single-purpose rights-of-way limit the use of the land resources. The traffic on highways and railroads preclude any other activities. Frequently, the traffic has secondary impacts like noise, limited access, and environmental hazards which affect neighbouring lands. Land under narrow electric distribution lines has limited other uses except for agriculture. Often, such electric lines restrict the use of neighbouring lands for forestry because of the need for the right-of-way to be kept clear of danger trees. The impacts of single-purpose rights-of-way are usually for the public-at-large or for distant communities. Seldom are the local benefits evident.

In contrast, multiple-purpose rights-of-way normally necessitate little change in the traditional uses of the land. Frequently they create higher land use. They commonly have high local benefits affecting other resources and land uses like wildlife and domestic livestock grazing and for more intensive agriculture, recreation, transportation, and access to settlements.

In the study area, rights-of-way lands are used for agriculture and grazing. Much of this new agricultural land results from clearing of forest stands of low productivity. In many regions, wildlife also benefits from improved growth of shrubs and other vegetation. Clearing of rights-of-way and construction roads provide access for local transportation, logging, trapping, grazing, recreation and other secondary uses.

Common criticisms to all rights-of-way are the withdrawals of land from the agricultural and forest land bases. In absolute terms, the criticisms may be true for single-purpose use rights-of-way but are only partially applicable to multi-purpose use rights-of-way. On many of the latter, large areas of relatively unproductive grazing and forest lands are converted into productive agricultural and grazing lands. However, one of the possibly justified criticisms of rights-of-way is often the unregulated uses of created access after construction because of trespass, poaching, weed control, and fire hazard to neighbouring lands.

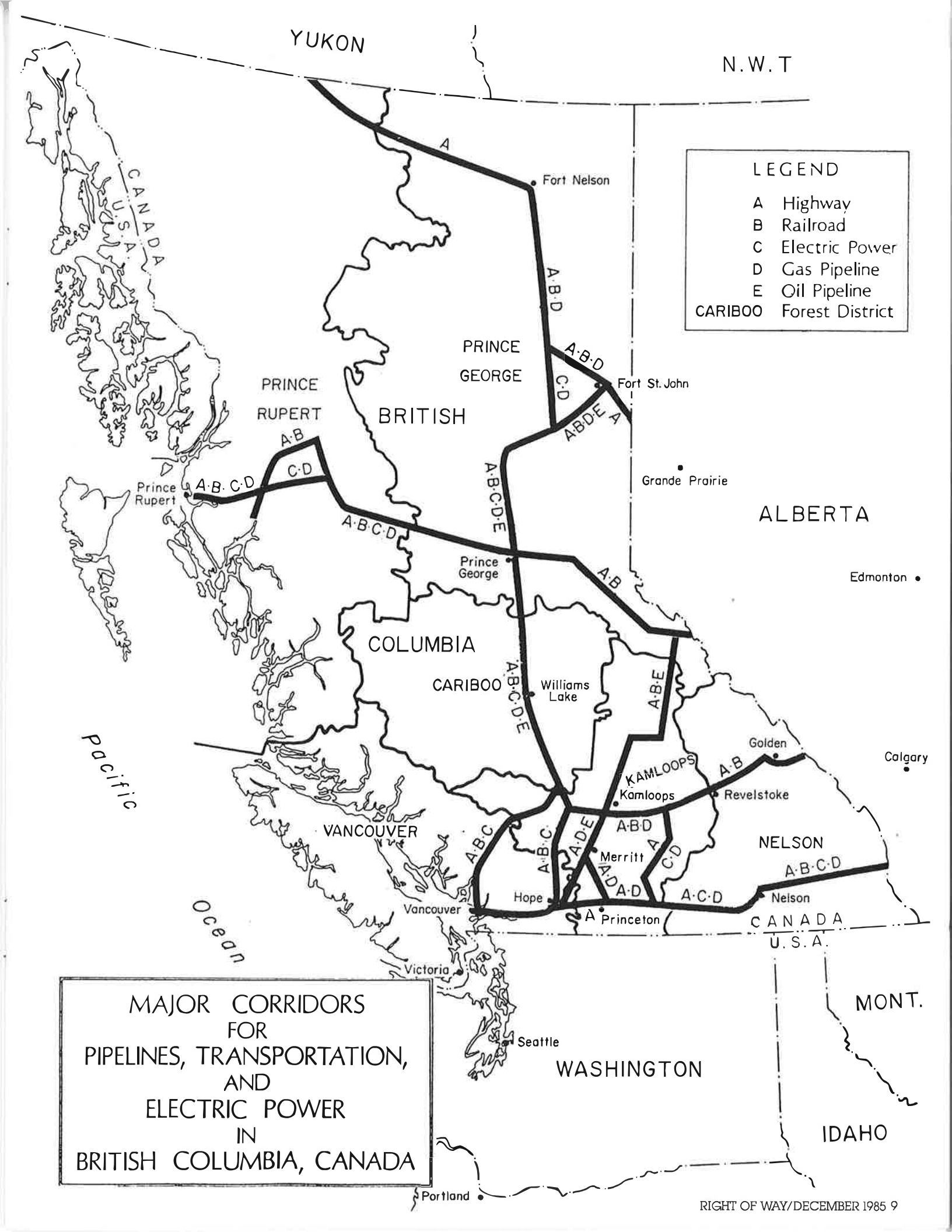
The losses of agricultural and forest land bases can be materially reduced by the "common corridor" concept for rights-of-way. When transportation and utility services are incorporated in a common corridor, the land losses are appreciably reduced by the construction of the single right-of-way. Sometimes, the concept is limited by aesthetics, wildlife crossings, and extra costs of construction to protect non-compatible uses.

In calculating the annual allowable cuts for Crown forests, the British Columbia Ministry of Forests allows for withdrawals for rights-of-way and other higher uses. Accordingly, the construction of the more common narrow rights-of-way does not affect the current timber supplies available to the forest industry.

The following schedule indicates the relative nominal widths and areas per kilometer used for the various types of right-of-way. Many examples exist where parallel rights-of-way traverse the country and utilize the sum of the full widths. In contrast, many examples also exist of common rights-of-way where more than one use is made of extremely narrow rights-of-way. Such common use may require extra precautions for safety, corrosion, or interference of one or more of the facilities with each other.

Characteristics of Common Rights-of-Way

Primary Use	Typical Width M (FT)	Area HA/KM (AC/MILE)	Multiple Uses
Highway	48.77 (160.00)	4.88 (19.39)	Transportation and scenic viewing
Secondary Road	20.10 (66.00)	2.01 (8.00)	Transportation only
Electric - Transmission	183.88 (600.00)	18.39 (72.73)	Grazing, forage, access, recreation, Xmas tree farm, agriculture
Electric - Distribution	6.10 (20.00)	0.61 (2.42)	Access
Pipeline - Gas and Oil	18.28 (60.00)	1.83 (7.27)	Grazing, forage, access, recreation, agriculture
Railroad	30.48 (100.00)	3.05 (12.12)	Transportation only


YUKON
N.W.T
LEGEND
A Highway
B Railroad
C Electric Power
D Gas Pipeline
E Oil Pipeline
CARIBOO Forest District
Fort Nelson
Fort St. John
Grande Prairie
PRINCE GEORGE
PRINCE RUPERT
BRITISH COLUMBIA
ALBERTA
Prince Rupert
Prince George
Williams Lake
CARIBOO
COLUMBIA
Edmonton
Calgary
Golden
Revelstoke
KAMLOOPS
Kamloops
Merritt
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MAJOR CORRIDORS FOR PIPELINES, TRANSPORTATION, AND ELECTRIC POWER IN BRITISH COLUMBIA, CANADA

Natural forage compared with neighbouring seeded right-of-way.

Benefits from Multi-Purpose Use Rights-of-Way

In the Interior Plateau of British Columbia most of the electric transmission and pipeline rights-of-way traverse forest lands which originally had secondary use for grazing. The productivity of the lands for both forestry and grazing was generally low. In most places, the clearing of the mature forest crop represented the end of a naturally grown forest of over 100 years old, usually much older.

After clearing and reseeding with domestic grasses, the grazing capability is increased 4 to 10 times the original productivity. On gas pipeline rights-of-way, the heat from compression in the "hot line" downstream of compressor stations causes earlier growth in the spring. Thus, the grazing season may be extended appreciably.

The rights-of-way are used for grazing large numbers of cattle. A current criticism is that by concentrating the cattle on a right-of-way, the surrounding natural areas are undergrazed. In reality, the cattle concentrate where an abundant and more nourishing supply of more palatable forage is available.

In areas south of Kamloops, B.C., the benefits from grazing on rights-of-way and clear-cut logging areas are most significant. Presently, the summer ranges are undergrazed but result in high weight-gains in the cattle.

The principal criticisms of the rights-of-way relating to grazing are:

- Drift fences are needed where the rights-of-way traverse natural grazing boundaries of dense thicket stands of coniferous growth.
- Cattle concentrate on the right-of-way for grazing.
- The rights-of-way provide easy access to remote areas and allow trespass by all terrain vehicles.
- The rights-of-way open up new areas for contamination by knapweed and other noxious vegetation.

Obviously, the first two criticisms are easily solved by the construction of drift fences and proper distribution of salt, and in general better livestock management. The criticisms of access introduces a far more serious subject.

A "grant-of-easement" for a transmission line or pipeline only permits the construction, operation, and maintenance of a facility. The Grantee has only the right of access to service the facility. The Grantee has no authority to prevent access or other uses except where danger to the installations may result.

The lack of control of access immediately reflects on the Ministries involved, particularly those of Forests and Environment. After construction both Ministries are faced with increased responsibilities, such as fire hazard, trespass cutting, poaching, and more intensive game management. Neither Ministry has powers to limit access unless conditions require emergency actions.

The mitigation of such access problems is to have Legislation and Regulations governing the administration of access for normal use. Such Legislation will be of little influence unless the Ministries have sufficient funds for the necessary supervision.

The control of knapweed also requires strict regulation of access and use. Whereas pipeline construction contracts may require cleaning of all equipment brought in from knapweed infested areas, no such regulations or procedures are in effect for private of Government vehicles. B.C. Hydro, Westcoast Transmission and other pipeline companies participate in all weed control programs for their respective rights-of-way, often in areas where no controls are practiced on neighbouring tenures.

The early growth along the "hotlines" on gas pipelines in early spring provides a valuable food source for moose and deer. In coniferous forest regions, the plants and deciduous shrubs which revegetate the rights-of-way provide valuable browse. In many areas, the additional browse on the rights-of-way and logging areas support larger numbers of ungulates than were present before developments.

Trappers make full use of rights-of-way for travelling and setting of traps along

the perimeters. The rights-of-way preclude the necessity for clearing of trails and provide easy access to more remote areas.

All-terrain vehicles and snowmobiles allow extensive uses of rights-of-way for both summer and winter recreation. This recreation, often in trespass on private lands, is beyond the control of the right-of-way Grantee. Criticisms of recreation uses are many, some of which are:

- Disturbance of cattle on open range
- Crushing of forage and destroying delicate vegetation
- Opening and not closing gates on drift fences and allowing cattle to roam
- Vandalism to remote buildings and machinery
- Most importantly, damage to drainage and erosion control facilities.

Again, the irresponsible and uncontrolled recreation use after construction cannot be controlled by the Grantee and requires enabling Legislation for regulation by Resource Ministries.

Access along powerline and pipeline rights-of-way frequently provides the initial routes for subsequent public roads and logging developments. This route pioneering by utilities is particularly significant in the mountainous regions of both the Interior and the Coast.

Many of the foregoing benefits are not quantitative individually or in any specific locality. When accumulated over many thousands of miles of rights-of-way, they appreciably influence other resources uses. These benefits are nearly always discounted because of criticisms of right-of-way uses after construction. In reality, these criticisms are about the lack of enforcement legislation and regulation and not about the construction and operation on the rights-of-way for the intended uses.

Economic Returns From Rights-of-Way

The economic benefits from converting unmanaged forest and grazing lands into higher uses are subject to differences of opinions and methods of valuation, applicable interest rates, and authenticity of basic data. Single-purpose use rights-of-way have very limited secondary uses; whereas, multi-purpose use rights-of-way have tangible and measurable benefits. For the latter, certain data are finite:

- The forest yield and values of stumpage on Crown lands.
- The range fees for grazing of domestic livestock on Crown lands, and
- The annual taxes paid by private companies for rights-of-way on Crown lands.

While the benefits of higher use can be calculated for the above, the added values for wildlife, recreation, and access are intangible. Nevertheless, these intangible benefits must be recognized even though they are not given monetary values.

Pipeline and highway in common right-of-way.

Much of the forest land withdrawn for rights-of-way in the Cariboo and Kamloops Forest Regions is of lower site quality and productivity than the lands used for commercial forest operations. During the years 1978-1982, inclusive, some 267,689 hectares of land were logged and produced $340,180,000 of gross stumpage and royalty payments, or $1,271 per hectare. This stumpage return is equivalent to $2,326 per kilometer on an 18.28 meter (60-foot) gas pipeline right-of-way.

This value represents the actual returns to the Government from the sale of mature timber with an average age of well over 100 years. On the premise that grazing fees were collected on the same lands, the accumulated value of the annual fees, based on average productivity under forest stands and invested at five percent interest, is some $1,462 per kilometer of right-of-way. Thus, the total value on a 100-year rotation for timber production and grazing is $3,788 per kilometer.

The grazing capacity of seeded right-of-way is estimated to average five times the grazing capacity of unmanaged forest stands. Accordingly, on the same basis as above, the value of grazing fees alone in 100 years is $7,360 per kilome-

Deciduous browse on right-of-way containing two big-inch gas pipelines.

Grazing on dual pipeline right-of-way.

ter or nearly twice the combined value for unmanaged forestry and grazing.

The combined forestry and range values could be appreciably improved with intensive resource management of the forest and range potentials. In the foreseeable future, the possibility of intensive management is remote.

The taxation benefits from the installed pipelines are more dramatic than the resource yields to the public revenues. The annual taxes paid per kilometer on the Westcoast Transmission gas pipeline are some $4,700 per kilometer. If accumulated at five percent, some $12,340,000 in taxes are paid for each kilometer of right-of-way during a 100-year period.

Conclusions

New rights-of-way across the Interior Regions are inevitable with future developments for transportation, electric power and oil and natural gas transmission.

Opposition to new developments has overshadowed the potential benefits available from past developments because basic concepts have not been recognized: namely,

- The differences between single-purpose use and multiple-purpose use rights-of-way;
- The reduced impacts to local resources by using "common corridor" rights-of-way;
- The forest management plans have allowances for withdrawals of lands for higher uses so reasonable withdrawals for rights-of-way do not affect the annual allowable cuts;
- The secondary uses on multiple-purpose rights-of-way have high economic and social returns to the public, and
- The negative impacts of rights-of-way on grazing, wildlife, and forestry after construction are largely due to a lack of legislation and regulations covering access on Crown lands to enable the Ministries to effectively administer resources in their respective jurisdictions.

Acknowledgements

The Authors acknowledge the contributions and counsel of many persons in Government Ministries, the Forest Industry, and the Ranching Industry in the Cariboo and Kamloops Regions. In principle, the foregoing conclusions reflect the consensus opinions of individuals directly involved in the administration and use of lands and resources affected by major rights-of-way.

Three pipelines in common right-of-way. Ground cover 4 years after seeding.