

AN INTRODUCTION TO THE RESOURCE MANAGEMENT  
TRAIL AT THE KANANASKIS FOREST EXPERIMENT

STATION, SEEBE, ALBERTA

BY

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*TABLE OF CONTENTS*

	<u>Page</u>
INTRODUCTION .....	1
TRAIL SIGN INFORMATION .....	6
CHECKLIST OF BIRDS OF THE KANANASKIS FOREST EXPERIMENT STATION AND SURROUNDING AREA .....	26
CHECKLIST OF MAMMALS OF THE KANANASKIS FOREST EXPERIMENT STATION AND SURROUNDING AREA .....	29
CHECKLIST OF HIGHER PLANTS ALONG THE KANANASKIS RESOURCE MANAGEMENT TRAIL .....	30
CHECKLIST OF INSECTS AND DISEASES OF THE KANANASKIS FOREST EXPERIMENT STATION AND SURROUNDING AREA .....	33
TRAIL BROCHURE .....	Inside back cover

## *INTRODUCTION*

The Resource Management Trail of the Kananaskis Forest Experiment Station (K.F.E.S.) is available as an outdoor classroom for those with an interest in the forest environment, forest ecology, and the way in which the forest serves mankind. The trail is part of the Public Awareness Program at the K.F.E.S., which is located about 40 miles (65 km) west of Calgary along the new Kananaskis Highway (Figure 1).

The main objective of the Public Awareness Program is to give people an opportunity to experience the forest firsthand and to learn about the use and management of forest land, water, timber, recreation, and wildlife. The self-guiding trail introduces visitors to the resources and environment of the forest through the use of signs, displays, and a viewpoint deck (Figure 2). The trail is supplemented by a Visitor's Centre (Figure 3) with an information desk and displays which show the various components of the forest, which include water, recreation, wood, and wildlife. The purpose of the Centre is to develop basic concepts of the forest and forest resources and to show human use of the forest, leading to a rationale for control and management of forest resources.

This report presents the texts and illustrations on the signs along the trail along with checklists of common birds, mammals, insects and diseases, and vegetation of the forest. An illustrated trail brochure is included in the back pocket.

Staff are available at the Centre to provide information and service from early June to early September. Visits can be scheduled before and after the June-September period by special arrangement. All group use of Resource Management Trail facilities must be scheduled in advance. As conditions of group use we prefer that instructors or supervisors visit the site in order to acquaint themselves with the facilities before bringing the group, and we require a statement of intended use at the time of scheduling.

Visits may be scheduled with:

Mr. Gerry Dixon, Senior Technician  
Kananaskis Forest Experiment Station  
Seebe, Alberta (Ph. 403-673-2206)

or:

Mr. Bob Hill, Regional Information Officer  
Northern Forest Research Centre  
5320 - 122 Street  
Edmonton, Alberta (Ph. 403-435-7210)  
T6H 3S5

FIGURE 1. LOCATION OF K.F.E.S.

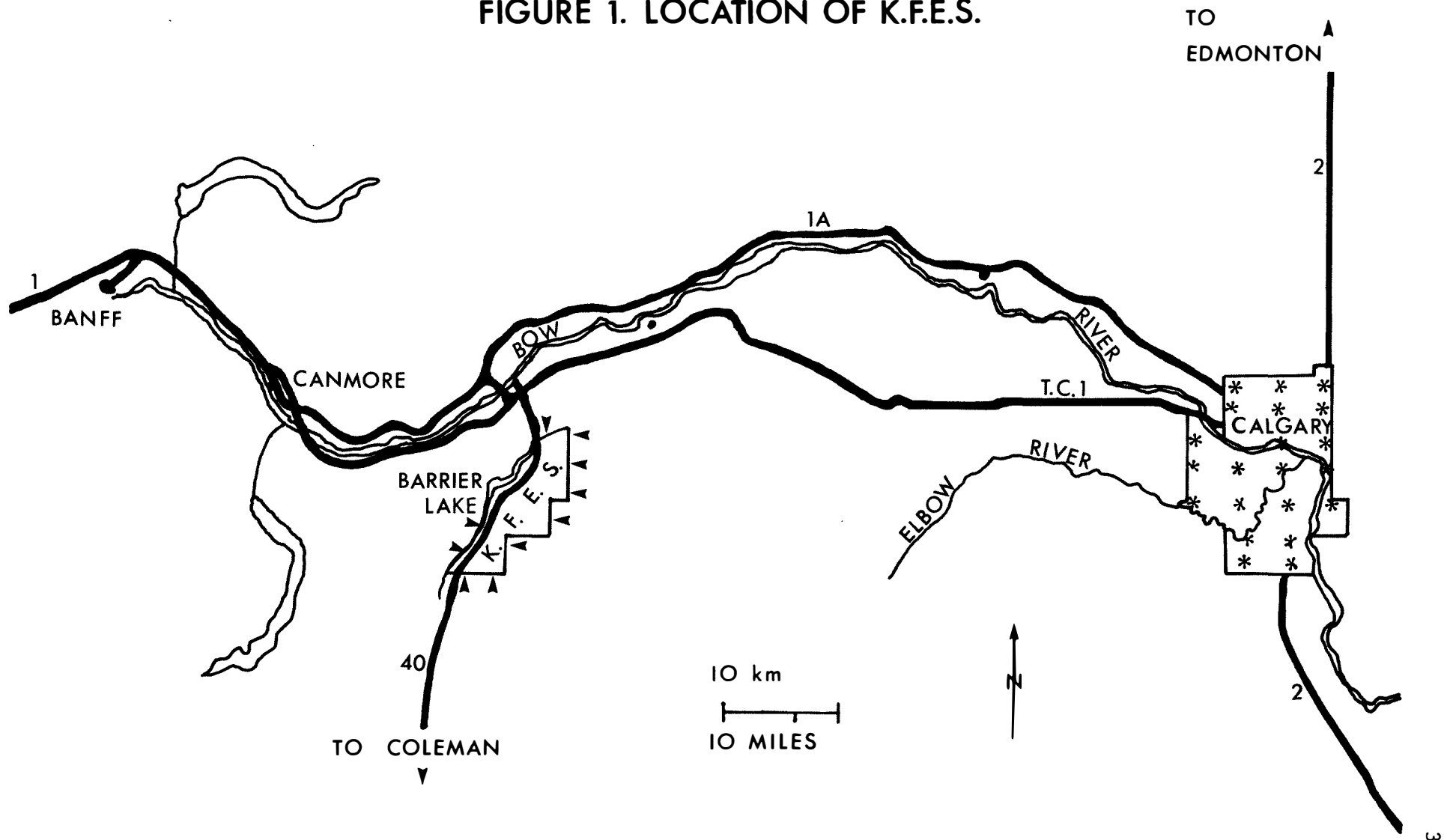
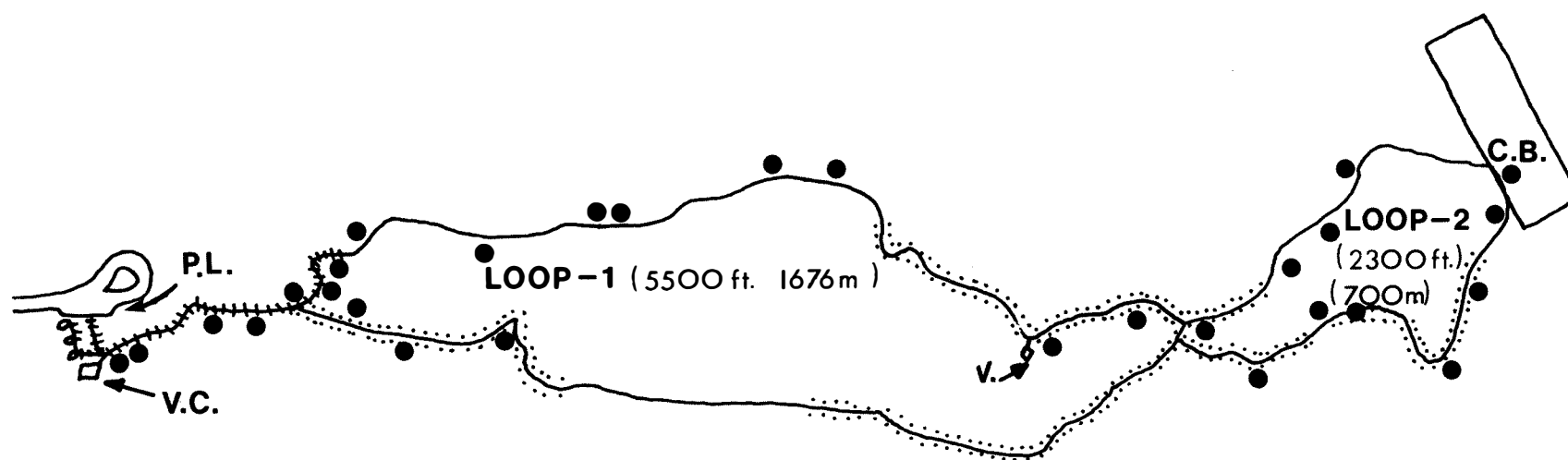


FIGURE 2. RESOURCE MANAGEMENT TRAIL K.F.E.S.

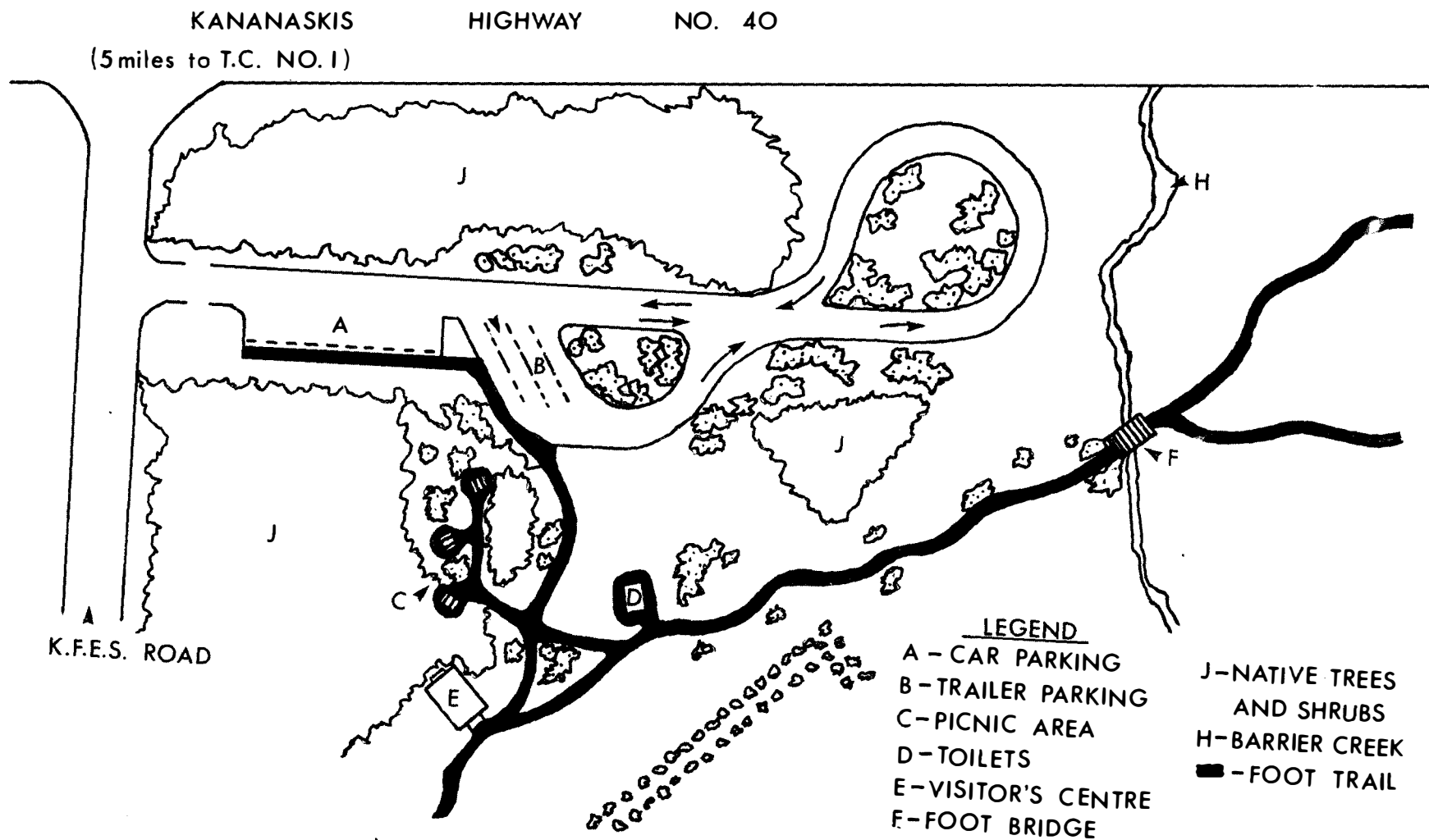


- LEGEND**
- SHALE TRAIL - - - - -
  - NATURAL TRAIL - ———
  - WOOD CHIP TRAIL - ·····
  - TRAIL STOPS - ●●

- P.L. - PARKING LOT
- V. - VIEWPOINT
- V.C. - VISITORS CENTRE
- C.B. - CUT BLOCK

**TOTAL TRAIL DISTANCE- 7800 FEET  
- 2376 M**

FIGURE 3. PARKING LOT AND VISITOR'S CENTRE



## TRAIL SIGN INFORMATION



LODGEPOLE PINE (PINUS CONTORTA)

Lodgepole pine, the most common evergreen in this region, is named for its historical use as Indian teepee poles. An outstanding feature of this tree is its ability to store seed along the branches in resin-sealed cones, which only release seed when heat from fire or the sun melts the seal. Most of the dense pine forests you see in this region grew from seed released following forest fires.



WESTERN WHITE SPRUCE (PICEA GLAUCA)

Western spruce occurs throughout this region mixed with aspen (Populus tremuloides) and lodgepole pine at lower elevations, and with Engelmann spruce (Picea engelmannii) and alpine fir (Abies lasiocarpa) at higher elevations.

White and Engelmann spruce interbreed in this region and are often difficult to distinguish as pure species.

Spruce have single needles which are stiff and sharp to the touch. They grow best in moist areas.

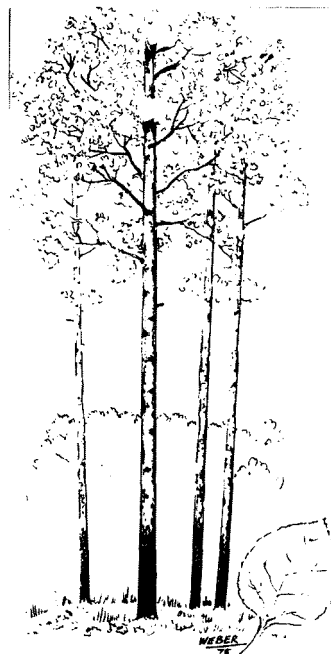




BALSAM POPLAR AND WILLOW  
(POPULUS BALSAMIFERA AND SALIX)

Balsam poplar and willow are not common along the trail but you may find them if you watch closely. They usually grow in moist locations, particularly along streams.

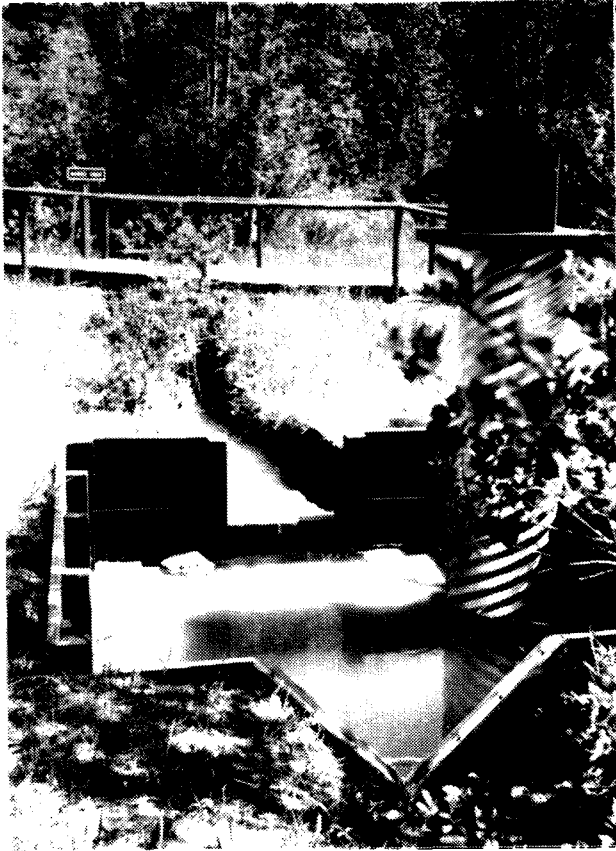
Examine the poplar leaves and compare them to the leaves of the tree at the next trail stop.



TREMBLING ASPEN (POPULUS TREMULOIDES)

Trembling aspen is the most common deciduous tree along the trail. Aspen usually regrows from suckers off the roots of parent trees following logging or destruction by fire or wind, rather than from seed.

Why do you think these trees are called "trembling" aspen? Can you see the difference between aspen and poplar leaves?



MEASURING STREAMFLOW

This stream gauge gives a continuous record of the flow of water from a 700-acre area (watershed). Adequate planning and control of activities such as logging, mineral exploration, and mining in watershed areas requires a knowledge of the rate, seasonal change and purity of streamflow, and the effects of land and vegetation disturbance upon them.

You are invited to measure streamflow and estimate water supply from this watershed by following the instructions on the gauge.

INSTRUCTIONS FOR MEASURING STREAMFLOW

1. From the chart on the recorder, read water depth to the nearest hundredth of a foot.
2. Find that water depth in the table.
3. Read streamflow under appropriate column in rows A, B, and C. Row "A" shows the unit in which streamflow is generally expressed, and row "B" gives its metric equivalent. You may be more familiar with gallons per day (row C).

Example

Suppose water depth from chart on recorder is 1.46 feet.

Reading across from 1.4 feet in the first column to the values given in the 0.06 column, we get:

- A) 1.88 cubic feet per second
- B) 53.24 litres per second
- C) 1,012,000 Imperial gallons per day

If the average Calgary family uses 300 gallons of water per day, how many families could be supplied from this small stream at the present rate of flow?



(JUNIPERUS COMMUNIS)

(JUNIPERUS HORIZONTALIS)

GROUND JUNIPER (JUNIPERUS COMMUNIS)  
AND CREEPING JUNIPER (JUNIPERUS  
HORIZONTALIS)

Ground juniper will be seen frequently along the trail. Carefully feel the leaves, and look for the powdery-blue juniper berries. The Berries are edible but bitter.

Creeping juniper can be found for the next 15-20 feet along the right side of the trail. Note the difference between the leaves of these two junipers.

Both junipers prefer warm dry areas and are often found growing with lodgepole pine.



DWARF MISTLETOE (ARCEUTHOBium  
AMERICANUM) IN SPRUCE

The clumping (witches' broom) on the branches of this tree is caused by a parasitic flowering plant known as dwarf mistletoe. It is not a common spruce parasite in the region as a whole but is common in this area.



EVIDENCE OF FOREST FIRE

Forest fires vary in intensity from raging crown fires capable of destroying all living things in their path to surface fires which cause relatively small changes. The charred stumps and charcoal on the ground along this trail are the remains of one or more earlier forests almost completely destroyed by fire, most recently about 80 years ago. In contrast, low-intensity surface fires may only burn off part of the living skin at the base of the trees, which heals with new tissue from the sides, just as new skin covers a burn on your hand.

The prevention and control of fire continues to be a major factor in plans and prospects for forest land management in this region.

VISIBLE AREA MAP OF PIGEON MTN.

Seen Area		Directly visible		
Screened Area		100' + 300' below line of sight		
Blind Area		300' + below line of sight		
Coverage of Tower - 15 mi. radius - 707 sq. mi.				
Seen	150.5	sq. mi.	21.3	%
Screened	59.8	sq. mi.	8.5	%
Blind	496.7	sq. mi.	70.2	%
Coverage of Tower - 25 mi. radius - 1964 sq. mi.				
Seen	235.8	sq. mi.	12.1	%
Screened	129.7	sq. mi.	6.6	%
Blind	1583.5	sq. mi.	81.3	%

Elevation 6000'



LOGEPOLE PINE FOREST COMMUNITY

For the next 200 feet you will be walking through a forest community in which lodgepole pine is the most common tree. Foresters recognize this as a pine "stand" for purposes of timber management to produce fence posts and rails, lumber, and paper products.

Within forest communities plants and animals develop unique relationships which include arrangements for food, shelter and protection from enemies. Man's understanding of forest communities determines the degree to which he can change and regulate them for different purposes; for example, to encourage or discourage different birds, animals or plants within the community.



MIXEDWOOD FOREST COMMUNITY

Aspen and lodgepole pine are the most common trees in the mixedwood community you are now entering. This mixedwood contains more open spaces and a greater variety of plant species than the previous pine community.

A low intensity surface fire about 40 years ago probably encouraged mixedwood development by killing pine trees, thereby increasing the amount of light reaching the ground and encouraging aspen growth. This has made the area more attractive to birds and animals, especially species like grouse and deer.

Note the surface fire scars at the base of some pine trees along the trail.



### TREMBLING ASPEN FOREST COMMUNITY

This forest community is dominated by trembling aspen. Like lodgepole pine, aspen comes back quickly after fire, but in a different way. Fire kills the above-ground parts but not the network of roots. Buds along the roots sprout to form new stems called "suckers". Here you can see a group (clone) of aspen trees which sprang up as suckers after a forest fire.

Aspen serves as a source of food for grouse, beaver, moose, elk, and deer.



### BEARBERRY (ARCTOSTAPHYLOS UVA-URSI)

Bearberry (called Kinnikinnick by the Indians) is an evergreen shrub commonly found in thick mats on dry exposed areas. It is often one of the first green plants to grow on denuded or eroding slopes, helping to stabilize the soil.

You will see bearberry growing on the open slope immediately in front of the viewpoint deck ahead, and on the eroding banks of Stony Creek, visible to the left of the viewpoint deck. The dried leaves of bearberry were used as tobacco by Indians.



SHOESTRING ROT (ARMILLARIELLA MELLEA)

Shoestring rot kills young trees and acts as a natural thinning agent in older lodgepole pine. It passes from root to root in the soil by means of a strand which resembles a shoestring, killing trees in circular groups. This is one way in which nature reduces overcrowding in some lodgepole pine communities.



BUFFALO BERRY (SHEPHERDIA CANADENSIS)

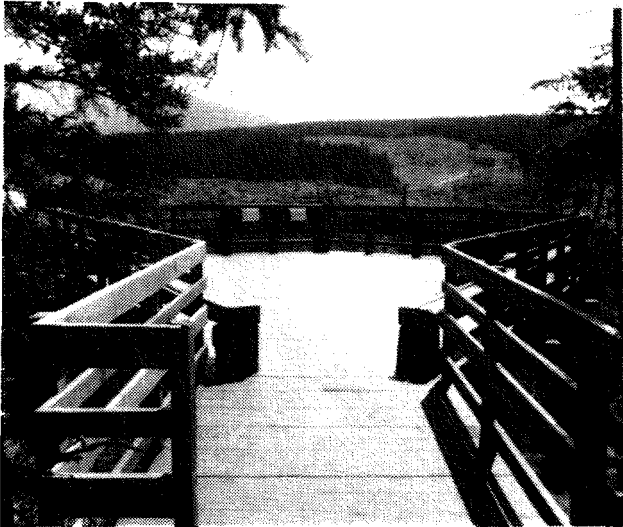
Buffalo berry is a common shrub in this region. It has bitter-tasting red berries in July and August which are valuable food for a variety of birds and animals. It also improves soil nutrition by adding nitrogen to the soil.



BLOWDOWN AREA

Strong winds from mountain valleys can be channeled into natural "wind tunnels". Spruce are more easily up-rooted by such winds than pine because they tend to have flat "shallow" root systems. Winds here may exceed 100 m.p.h.

These spruce trees were up-rooted by wind in 1975. The skeletons of earlier victims of wind in this natural wind tunnel are scattered along the sidehill to your right, and can be seen from the trail.



MANAGING FOREST LAND AND RESOURCES

The timber, water and wildlife on the land visible from this viewpoint can continuously provide for man's needs if the area is managed wisely. That is why they are called "renewable resources".

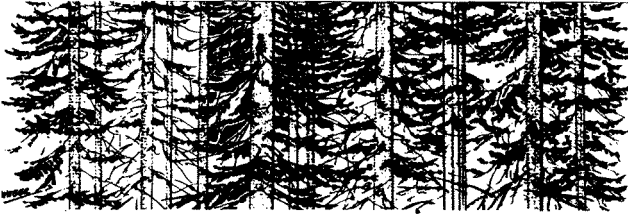
The artist's sketch shows one way in which the land could be zoned for renewable resource management. Scientific surveys were made to determine the most suitable use for each area, before zoning. In practice, uses which do conflict are put into separate zones or given different priorities within the same zone. For example, in the zones shown here, wildlife and watershed protection could be combined in the same zone with little or no conflict. Wildlife and timber production could be combined in the timber zone if special logging practices were followed to provide for habitat needs of designated wildlife

species. If logging were carried out in the Station watershed careful planning would be necessary to prevent erosion, which would reduce water quality. You may be familiar with zoning as used in planning community development.

#### THE ROLE OF FOREST FIRE

Believe it or not, nearly all of the forest you can see from this viewpoint has been burned in the past 200 years, most of it since 1890. What's more, the same thing has been happening at intervals over the past 6,000 years.

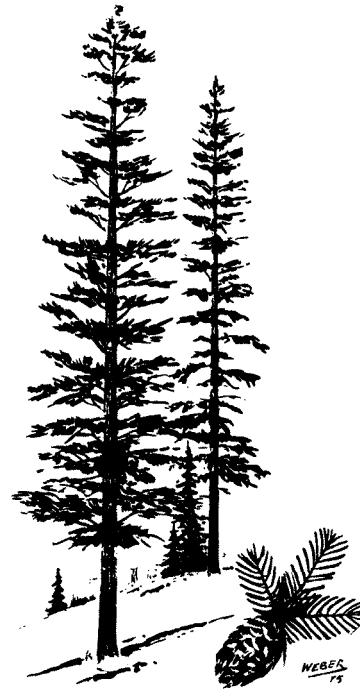
Man tries to prevent and control wildfire because it interferes with his attempt to manage forests in a planned way. He substitutes cutting, mechanical treatments and even controlled fire for wildfire. However, the odds are that man will never eliminate occasional holocausts and although the forests will survive, the effects on man's use of the area may be drastic.



### WESTERN WHITE SPRUCE COMMUNITY

Western white spruce is the main tree in this forest community. Although the location appears to be dry the spruce are growing well because of a clay soil which holds sufficient moisture. As you probably know from experience in your own yards at home it is important to recognize that different plants require different locations for best growth, and this is an important factor when planning reforestation.

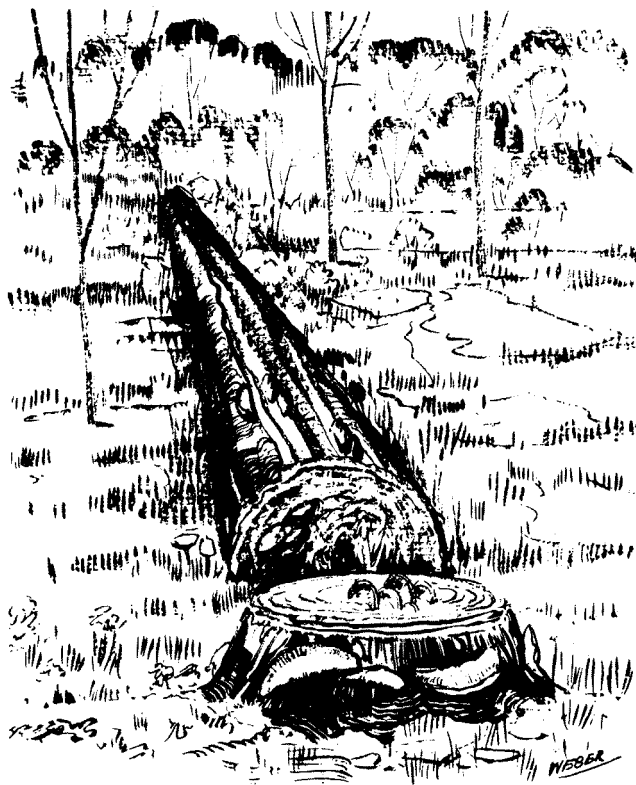
Watch for squirrels in this area. They are important members of the spruce forest community. Can you find the cache where squirrels store cones for winter?



### DOUGLAS FIR (PSEUDOTSUGA MENZIESII)

Seventy years ago Douglas fir was much more common here than it is today. Loggers cut many trees to supply timber for the growing city of Calgary, and the species is only recently regrowing in many parts of the area. You will find some young Douglas fir marked near the trail junction ahead. Note the fragrant smell of the needles when you crush a few between your fingers. That is one reason why the species is prized as a Christmas tree.





SLASH FUNGUS (LENZITES SPP. AND  
PENIOPHORA SPP.)

Fungi such as the one growing on this stump and log cause decay in dead trees and branches, thereby returning food to the soil for reuse by other plants and animals. The process of decay is a vital link in the chain of forest life.



SOIL PROFILE

Soil provides support, food and water for trees and other forest plants and is the home of other organisms such as insects and fungi.

Notice the different layers in the soil. Can you see plant roots? With training you can tell a great deal about the history of an area by examining a soil profile like this one.

A knowledge of soils is important in planning the uses of forest land.

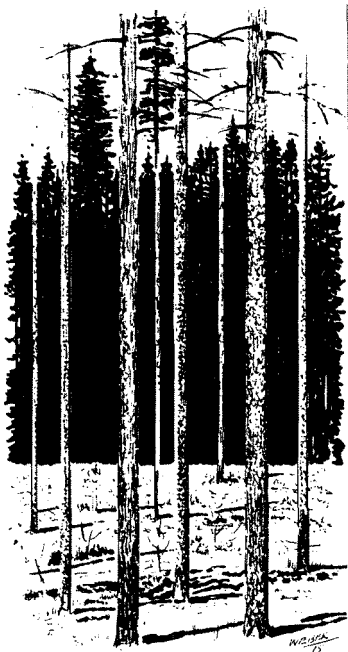
### SOIL PROFILE DESCRIPTION

Soil such as this - called brunisols - occur in dry mountain valleys throughout the region. Soil horizons (which appear as different layers in the soil and together make up the soil profile) are often poorly developed and difficult to see because of factors such as low precipitation, high lime content, unstable land and the short period of time since soil-forming processes began. Such soils generally have the following characteristics:

<u>Horizon</u>	<u>Description</u>
LFH	Shallow organic surface horizons
Ae	Shallow, bleached upper mineral horizons
Bm	Mineral horizon altered by deposits of materials from the Ae horizon and by chemical processes
C	Mineral horizon relatively unchanged by soil-forming processes. This is what the entire soil profile looked like before soil-forming processes began.
	A "k" in the description (Ck) indicates high lime content (calcium carbonate) in the parent material.

## A DETAILED DESCRIPTION OF THE SOIL PIT FOLLOWS HERE:

Classification:	Orthic eutric brunisol
Parent Material:	Glaciofluvial sands
Slope:	About 5% across the pit and averaging about 8% in the vicinity
Relief:	About 50 m with a slope length of about 400 m
Elevation:	1425 m
Aspect:	North
Estimated Drainage:	Rapidly drained
Water Table:	Below the sampling depth for most, if not all, the year
L	Average of 1 cm thick; slightly decomposed needles and leaves; abundant fine and medium oblique roots. No humus accumulation.
Ae	Discontinuous; brown sandy loam; very weak, very fine to fine platy; friable; plentiful fine roots; few very fine pores; no clay films; no effervescence; clear broken boundary;
Bm	Average of 18 cm thick; strong brown and occasionally yellowish red sandy loam; structureless to very weak fine to medium subangular blocky; friable; abundant medium roots; few fine pores; no clay films; no effervescence; clear wavy boundary;
Ck1	Average of 12 cm thick; brown sandy loam; structureless; friable; plentiful fine roots; very few fine pores; no clay films; strong effervescence with 10% HCl; clear wavy boundary;
Ck2	Remainder of soil profile; grayish brown sandy loam; structureless; friable; few medium roots; very fine pores; no clay films; strong effervescence with 10% HCl.

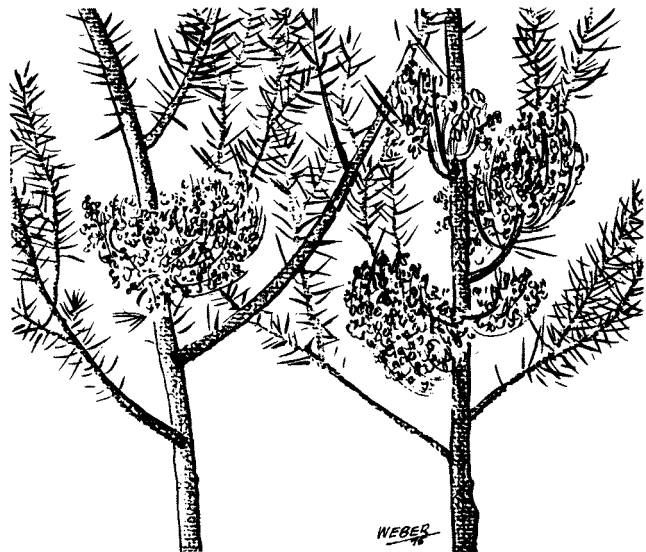


#### THINNING AND PRUNING

Notice the large lodgepole pine with clean stems, the result of hand pruning and thinning about 25 years ago.

Pruning has little application today in lodgepole pine grown for commercial wood products. It is applied in forests used for intensive recreation, like camping, mainly to improve access.

Thinning to increase the yield per acre of commercial wood products is now confined mainly to dense young stands. It is also applied in recreation areas to maintain forest health and to reduce the risk of injury from falling trees.



YELLOW WITCHES' BROOM IN SPRUCE  
(CHRYSONYXA ARCTOSTAPHYLI)

The yellow witches' broom is caused by fungus and is a common sight on spruce in this area. It produces a pungent odor in June and early July which can be detected 15 or 20 feet away. Do not confuse yellow witches' broom with witches' broom caused by dwarf mistletoe.



CLEARCUTTING OF LODGEPOLE PINE

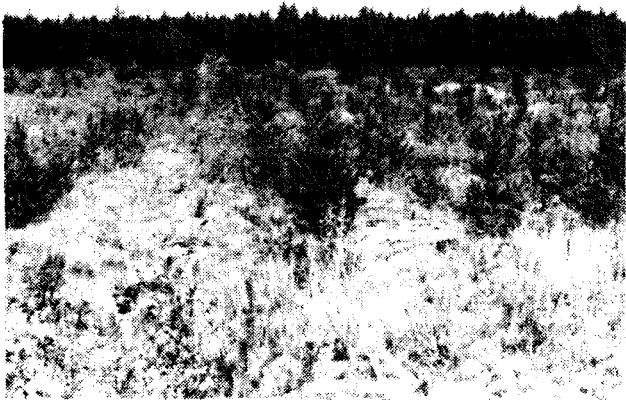
Clearcutting is the most feasible way to harvest the dense even-aged pine forests of this region and produce conditions suitable for reforestation of the species.

Branches left on the ground after logging carry cones which can provide seed for a new forest when mineral soil is exposed by scarification with heavy equipment. The cool, short growing season in this region results in relatively slow growth for about the first 10 years when trees are grown from seed in this way. Planting with well-started nursery stock can help overcome the problem of slow initial tree growth in many areas.



REFORESTATION

There are a variety of ways to reforest after the forest has been harvested. The example shown here is for lodgepole pine. The least costly method is disturbance of the soil by special machines (scarification) and reliance upon seed which is stored in the cones of the logging residue (slash) to provide new seedlings. The result in this mountainous area is often slow growth for from 5 to 20 years. Other methods include planting of nursery-grown bare-root stock and planting of stock which is grown in special containers in the greenhouse. The latter two methods may be 2 to 3 times as costly at the first, but generally result in faster growth and earlier reforestation of an area.



#### CHANGES

The pace of change is slow in a forest which has reached "adulthood". You have been walking through such a forest up to this point on the trail.

Forest harvesting triggers a quickening of the pace of change as grasses, herbs and shrubs invade the area, and young trees begin their vigorous juvenile growth.

This series of photographs shows such changes over the first few years after a forest is harvested.



#### SITE PREPARATION

These barrels are used to prepare the soil for reforestation. Heavy anchor chains or tractor pads may be used for the same purpose, either by themselves or in combination with barrels.

Drum choppers may also be used to prepare a site for reforestation.



NATURAL SUCCESSION

There is a natural tendency for spruce seedlings, which grow well in shaded areas, to invade land occupied by trees like pine whose seedlings do not grow well in shade. This invasion is called natural succession and is seen here in an early stage. Succession may take years and can be encouraged or discouraged by management if the germination and growth requirements of the species involved are well understood.



COMANDRA RUST (CRONARTIUM COMANDRAE)

Comandra rust is a fungus which attacks lodgepole pine, killing up to 20% of seedlings and causing damage (as shown here) to older trees. Squirrels like the sweet sap which flows from the wood and a chewed area on the stem is an indication of a comandra rust attack.

### OLD TREE NURSERY

You are standing in a tree nursery established about 40 years ago and abandoned in 1954. The Norway spruce and Scots pine planted here are not widely used in the region today, but were tested in the past as possible prospects. You will see Scots pine along the trail ahead which were planted 25 years ago.



DUNES

The ridge you are walking along is a sand dune. It was formed by winds blowing across fine silt and sand deposited here about 7,000 years ago by streams from a melting glacier. The dunes are now stabilized by vegetation which can survive in the dry conditions along the ridge.



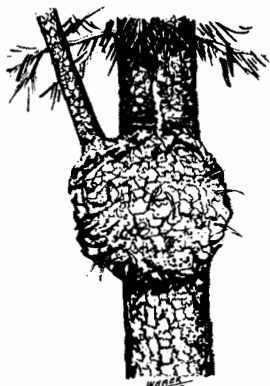
DWARF MISTLETOE (ARCEUTHOBIVM AMERICANUM)  
IN LODGEPOLE PINE

Lodgepole pine is much more susceptible than spruce to infection by dwarf mistletoe. Note the characteristic witches' brooms on the branches of this tree. Heavy infection slows growth and reduces the value of pine for commercial wood products.

The recommended control is removal of infected trees, usually in combination with controlled burning.

Can you see any small green mistletoe plants growing on the branches of this tree?





WESTERN GALL RUST (ENDOCRONARTIUM  
HARKNESSII)

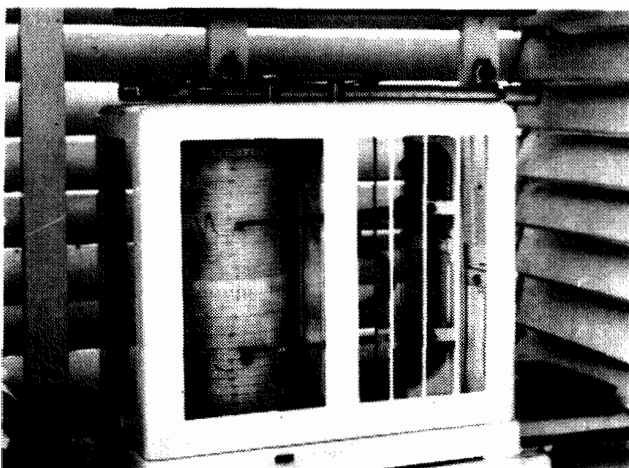
You have probably seen the swellings caused by western gall rust before, as it is common in lodgepole pine. It is seldom fatal, but can reduce the growth of trees. The spores of this rust pass directly from pine to pine, rather than requiring spore development on other plant species (alternate hosts) before re-infection of trees, as is the case with most tree rust fungi.



SNOW AND WIND DAMAGE

The effects of snow and wind are often evident in forests as illustrated in this small aspen community where many trees have been bent or broken by wet snow and wind. The force of wind alone may break or topple individual trees or large areas of forest.

The harsh mountain climate is a risk factor in the use and management of forest land. It can result in loss of timber yield, damage to structures, deterioration of recreation areas, and hazards to campers, hikers and other recreationists.



#### LOCAL CLIMATE

In this sheltered area the air temperature and wind velocity tend to be lower and the relative humidity higher than in the exposed area at the next trail stop. Compare the temperature and humidity readings at the two locations, noting in particular the relatively poor growth of vegetation on the exposed area. You can see why local climate is so important in planning the use and management of land in this region, for example, in selecting campgrounds and for choosing tree planting areas.

#### HYGROTHERMOGRAPH

Temperature

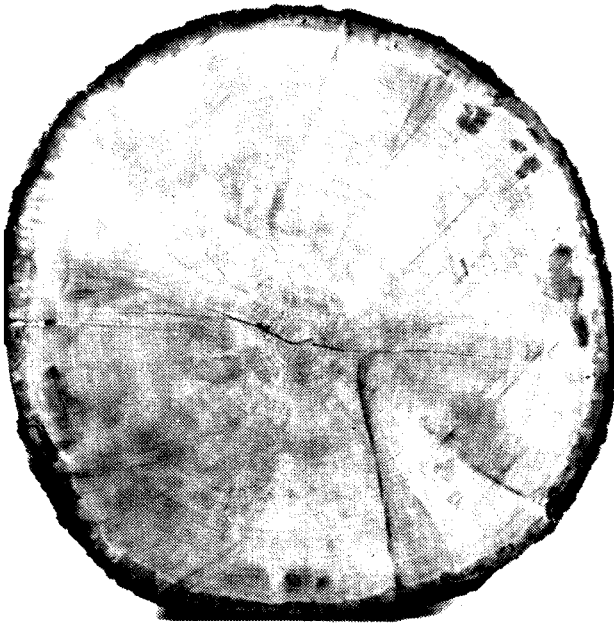
Relative humidity

Humidity hair element

Bimetallic temperature element

The bimetal assembly consists of two different metals which react to temperature changes at different rates. This causes contraction or expansion relative to temperature change, resulting in movement of the pen.

The humidity assembly is a human hair element which reacts very accurately to changes in relative humidity. Low humidity causes the hair to shorten and high humidity causes it to lengthen, moving the pen on the chart.



#### VETERAN PINE

This 200-year-old pine represents the forest that was, the forest that is, and the forest that could be. It is a veteran of two forest fires and the attacks of insects and disease.

The huge scar shows that the first fire was very hot. The heat opened cones and some of the seed that was released grew to become the younger trees that surround you. Both this grandfather and its children now bear seed which could establish a new forest.

This tree is living testimony to dynamic change in the past, change which is accelerating as man's activities increase. Are you aware of your responsibilities for guiding and controlling the use and management of public forest lands and resources?

CHECKLIST OF BIRDS OF THE KANANASKIS FOREST  
EXPERIMENT STATION AND SURROUNDING AREA

This is a list of the species of birds that you may see during your visit here. In list I are those species reported from the Station, and in list II those species reported from the surrounding area but not yet from the Station. Please report your observations of species not on list I and II to the Visitor's Centre before you leave. This will assist us in verifying our lists.

Letters after the names of the birds have the following meaning:

C	Common	Pr	Permanent resident
Fc	Fairly common	Sr	Summer resident
U	Uncommon	Wr	Winter resident
Sc	Scarce	PSr	Possible Summer resident
R	Rare	M	Spring or Fall Migrant; not resident
		Sv	Summer visitant
		Wv	Winter visitant
		Bs	Known to breed on the Station
		Ba	Known to breed in general area

List I - Birds recorded from the Kananaskis Forest Experiment Station

Common Name

Common Loon	FcSr, Bs	Common Merganser	CM, FcSr, Bs
Red-necked Grebe	FcM, PSr, Ba	Goshawk	FcPr, Ba
Horned Grebe	FcM	Sharp-shinned Hawk	ScSr
Eared Grebe	FcM	Cooper's Hawk	ScSr
Western Grebe	CM, PSr	Red-tailed Hawk	CSr, Bs
Whistling Swan	UM	Swainson's Hawk	USr
Canada Goose	FcM, Ba	Golden Eagle	USr, Ba
Snow Goose	UM	Osprey	USr
Mallard	CM, ScSr	Prairie Falcon	ScSr, Bs
American Green-winged Teal	FcM	Peregrine Falcon	ScM
Blue-winged Teal	FcM	Merlin	ScPr
American Wigeon	FcM	American Kestrel	FcM, ScSr
Northern Shoveler	FcM	Blue Grouse	FcPr, Bs
Lesser Scaup	FcM, PSr, Ba	Spruce Grouse	CPr, Bs
Common Goldeneye	CM	Ruffed Grouse	CPr, Bs
Barrow's Goldeneye	FcSr, Ba	White-tailed Ptarmigan	FcPr, Bs
Bufflehead	FcM, USr	American Coot	UM
Harlequin Duck	FcSr, Bs	Killdeer	USr, Ba
Surf Scoter	ScM	Spotted Sandpiper	CSr, Bs
		Solitary Sandpiper	USr, Ba

California Gull	USv	American Robin	CSr, Bs
Ring-billed Gull	USv	Varied Thrush	FcSr
Franklin's Gull	USv	Hermit Thrush	FcSr
Rock Dove	USv	Swainson's Thrush	CSr
Mourning Dove	USr	Mountain Bluebird	CSr, Bs
Great Horned Owl	ScPr	Townsend's Solitaire	FcSr
Saw-whet Owl	ScSr	Golden-crowned Kinglet	ScPr, Ba
Common Nighthawk	FcSr, Ba	Ruby-crowned Kinglet	CSr, Bs
Black Swift	USr	Water Pipit	FcSr
Rufous Hummingbird	FcSr, Bs	Bohemian Waxwing	CWr, PSr, Ba
Belted Kingfisher	FcPr	Cedar Waxwing	CSr, Bs
Common Flicker	CSr, Bs	Common Starling	CSr, Bs
Pileated Woodpecker	ScPr	Solitary Vireo	UM, ScSr, Ba
Yellow-bellied		Red-eyed Vireo	FcSr, Ba
Sapsucker	USr	Philadelphia Vireo	UM
Hairy Woodpecker	FcPr	Warbling Vireo	FcSr, Ba
Downy Woodpecker	UPr	Tennessee Warbler	ScSr, Ba
Black-backed Three-		Orange-crowned Warbler	FcSr, Ba
toed Woodpecker	ScPr	Yellow Warbler	CSr, Ba
Eastern Kingbird	USr	Magnolia Warbler	ScM
Western Kingbird	ScSr	Yellow-rumped Warbler	CM, FcSr, Bs
Say's Phoebe	UM, PSr	Blackpoll Warbler	UM, PSr, Ba
Traill's Flycatcher	ScM	Ovenbird	UM, PSr
Least Flycatcher	FcM, PSr	Northern Waterthrush	UM, PSr, Ba
Dusky Flycatcher	FcSr	MacGillivray's Warbler	FcSr, Ba
Western Wood Pewee	FcSr, Bs	Common Yellowthroat	FcSr, Ba
Olive-sided Fly-		Wilson's Warbler	CSr, Bs
catcher	FcSr	American Redstart	UM, PSr, Ba
Horned Lark	FcM, Sr	House Sparrow	CPr, Bs
Violet-green Swallow	CSr, Bs	Western Meadowlark	USr, Ba
Tree Swallow	CSr, Bs	Red-winged Blackbird	FcSr
Bank Swallow	CSr, Bs	Rusty Blackbird	UM, PSr
Rough-winged Swallow	USr, Ba	Brewer's Blackbird	FcSr
Barn Swallow	FcSr, Bs	Brown-headed Cowbird	CSr, Bs
Cliff Swallow	FcSr, Ba	Western Tanager	USr, Ba
Gray Jay	CPr, Bs	Evening Grosbeak	FcWr, PSr
Black-billed Magpie	FcPr, Ba	House Finch	ScSr
Common Raven	CPr	Pine Grosbeak	CWr, PSr, Ba
Common Crow	CSr	Gray-crowned Rosy Finch	FcPr
Clark's Nutcracker	FcPr	Common Redpoll	CWr
Black-capped Chickadee	CPr, Bs	Pine Siskin	CSr, Bs
Mountain Chickadee	FcPr	American Goldfinch	USr
Red-breasted Nuthatch	FcPr, Bs	Red Crossbill	UPr
American Dipper	FcSr, ScWr	White-winged Crossbill	CPr
Winter Wren	USr	Savannah Sparrow	FcSr
Gray Catbird	USr	LeConte's Sparrow	USr
Dark-eyed Junco	CSr, Bs	White-throated Sparrow	FcM
Tree Sparrow	FcM	Fox Sparrow	ScSr
Chipping Sparrow	CSr, Bs	Lincoln's Sparrow	FcSr
Clay-colored Sparrow	UM, USr	Song Sparrow	USr
White-crowned Sparrow	CSr, Bs	Snow Bunting	FcWr
Golden-crowned			
Sparrow	USr		

List II - Birds not yet recorded from the Kananaskis Forest Experiment Station, but seen in the surrounding area

Common Name

Red-throated Loon	RM	Hawk Owl	ScWr, Ba
Pied-billed Grebe	UM	Pygmy Owl	ScPr
Great Blue Heron	USv	Great Gray Owl	ScPr
American Bittern	ScSr	Short-eared Owl	ScSr
Gadwall	ScM	Boreal Owl	ScWr
Pintail	FcM	Ruby-throated Hummingbird	ScM
Cinnamon Teal	ScM	Calliope Hummingbird	FcSr, Ba
Redhead	UM	Red-headed Woodpecker	RSv
Ring-necked Duck	FcM, ScSr, Ba	Lewis's Woodpecker	RSr
Canvasback	UM	Northern three-toed Woodpecker	UPr
White-winged Scoter	CM	Eastern Phoebe	ScM
Ruddy Duck	UM	(Alder Flycatcher	ScM)
Hooded Merganser	FcM, PSr	Hammond's Flycatcher	ScSr
Red-breasted Merganser	UM	Western Flycatcher	ScSr
Turkey Vulture	RSv	Purple Martin	ScM
Rough-legged Hawk	ScM	Blue Jay	ScWr
Ferruginous Hawk	RM	Steller's Jay	ScPr
Marsh Hawk	ScSr	Boreal Chickadee	ScPr
Bald Eagle	ScM, PSr, Ba	White-breasted Nuthatch	ScWr
Gyr Falcon	RWv	Brown Creeper	ScPr
Sharp-tailed Grouse	UPr	House Wren	ScSr
Sandhill Crane	RM	Rock Wren	RSr
Sora	USr	Brown Thrasher	ScSr
Common Snipe	ScM, PSr	Gray-cheeked Thrush	UM
Long-billed Curlew	RM	Veery	ScM
Greater Yellowlegs	USr, Ba	Sprague's Pipit	ScSr
Lesser Yellowlegs	ScM	Northern Shrike	ScWr
Least Sandpiper	UM	Black and White Warbler	RM
Long-billed Dowitcher	ScM	Nashville Warbler	ScM
Marbled Godwit	RM	Townsend's Warbler	ScSr
Northern Phalarope	ScM	Black-throated Green Warbler	ScM
Parasitic Jaeger	RSv	Bay-breasted Warbler	ScM
Herring Gull	RSv	Mourning Warbler	ScM, PSr
Bonaparte's Gull	ScM	Yellow-breasted Chat	ScSr
Common Tern	RM	Canada Warbler	ScM
Black Tern	RM	Bololink	RM
Band-tailed Pigeon	RSv	Purple Finch	ScSr
Yellow-headed Blackbird	ScSr	Hoary Redpoll	ScWr
Northern Oriole	RSr	Lark Bunting	RSv
Common Grackle	ScM, PSr	Vesper Sparrow	ScSr, Ba
Rose-breasted Grosbeak	ScM, PSr	Brewer's Sparrow	ScSr
Indigo Bunting	RSr	Lapland Longspur	ScM
Lazuli Bunting	ScSr	Chestnut-collared Longspur	RSv

Compiled by J.M. Powell from:

Powell, John M., Tom S. Sadler and Margaret Powell. 1975. Birds of the Kananaskis Forest Experiment Station and surrounding area: an annotated checklist. Environment Canada, Canadian Forestry Service, Northern Forest Research Centre. Information Report NOR-X-133.

## CHECKLIST OF MAMMALS OF THE KANANASKIS FOREST EXPERIMENT

## STATION AND SURROUNDING AREA

This is a list of some of the more common mammals which you may see during your visit to this area. Please report your observations of species not on the list to the Visitor's Centre before you leave. This will assist us in verifying our lists.

<u>Common Name</u>	<u>Latin Name</u>
Columbian ground squirrel	<i>Citellus columbianus</i>
Richardson ground squirrel	<i>Citellus richardsonii</i>
Columbian red squirrel	<i>Tamiasciurus hudsonicus</i>
Chipmunk	<i>Eutamias minimus</i>
Hoary marmot	<i>Marmota caligata</i>
Richardson pocket gopher	<i>Thomomys talpoides</i>
Longtailed mountain vole	<i>Microtus longicaudus</i>
White-footed mouse	<i>Peromyscus maniculatus</i>
Bushytailed wood rat	<i>Neotoma cinerea</i>
Pika	<i>Ochotona princeps</i>
Canada beaver	<i>Castor canadensis</i>
Mountain coyote	<i>Canis latrans</i>
Porcupine	<i>Erethizon dorsatum</i>
Black bear	<i>Euarctos americanus</i>
Grizzly bear	<i>Ursus arctos</i>
Northern Rocky Mountain Cougar	<i>Felis concolor</i>
Canada lynx	<i>Lynx canadensis</i>
Rocky Mountain wapiti	<i>Cervus canadensis</i>
Rocky Mountain mule deer	<i>Odocoileus hemionus</i>
Northwestern white-tailed deer	<i>Odocoileus virginianus</i>
Northwestern moose	<i>Alces alces</i>
Rocky Mountain bighorn sheep	<i>Ovis canadensis</i>

Compiled from:

Soper, J. Dewey. 1964. The mammals of Alberta. The Hamly Press Ltd.,  
Edmonton, Alberta

University of Calgary. 1974. The mountain environment and urban society.  
Kananaskis pilot study. Appendix 5-4. Environmental Sciences  
Centre (Kananaskis), University of Calgary, Calgary, Alberta.

CHECKLIST OF HIGHER PLANTS ALONG THE KANANASKIS  
RESOURCE MANAGEMENT TRAIL

This is a list of some of the species of plants which you may see on the trail. Please report your observations of species not on the list to the Visitor's Centre before you leave. This will assist us in verifying our lists.

Common Name

Latin Name

Lodgepole pine	<i>Pinus contorta</i> var. <i>latifolia</i>
Scots pine	<i>Pinus sylvestris</i>
Western white spruce	<i>Picea glauca</i>
Norway spruce	<i>Picea abies</i>
Aspen	<i>Populus tremuloides</i>
Balsam poplar	<i>Populus balsamifera</i>
Douglas fir	<i>Pseudotsuga menziesii</i>

Shrubs

Ground juniper	<i>Juniperus communis</i>
Creeping juniper	<i>Juniperus horizontalis</i>
Willow	<i>Salix</i> sp.
Green alder	<i>Alnus crispa</i>
Saskatoon	<i>Amelanchier alnifolia</i>
Shrubby cinquefoil	<i>Potentilla fruticosa</i>
Prickly rose	<i>Rosa acicularis</i>
Twining honeysuckle	<i>Lonicera dioica</i>
Low-bush cranberry	<i>Viburnum edule</i>
Buffalo berry	<i>Shepherdia canadensis</i>
Bearberry	<i>Arctostaphylos uva-ursi</i>
Blueberry	<i>Vaccinium myrtilloides</i>
Common wild rose	<i>Rosa woodsii</i>

Herbs

Common bluebell	<i>Campanula rotundifolia</i>
Twinflower	<i>Linnaea borealis</i>



Yarrow	<i>Achillea millefolium</i>
Everlasting	<i>Antennaria nitida</i>
Pink pusseytoes	<i>Antennaria rosea</i>
Showy aster	<i>Aster alpinus</i>
Purple aster	<i>Aster toliaceas</i>
Brown-eyed Susan	<i>Gaillardia aristata</i>
Groundsel	<i>Senico paperculus</i>
Goldenrod	<i>Solidago multiradiata</i>
Bunchberry	<i>Cornus canadensis</i>
White geranium	<i>Geranium richardsonii</i>
Blue-eyed grass	<i>Sisyrinchium sarmentosum</i>
Milk vetch	<i>Astragalus striatus</i>
Sweet vetch	<i>Hedysarum sulphurescens</i>
Pea vine	<i>Lathyrus ochroleucus</i>
Yellow sweet clover	<i>Melilotus officialis</i>
Yellow locoweed	<i>Oxytropis sericea</i> var. <i>spicata</i>
Vetch	<i>Vicia villosa</i>
Nodding onion	<i>Allium cernuum</i>
Western wood lily	<i>Lilium philadelphicum</i> var. <i>andinum</i>
False Solomon's seal	<i>Smilacina racemosa</i>
Wild lily of the valley	<i>Smilacina stellata</i>
White camas	<i>Zygadenus elegans</i>
Wild blue flax	<i>Linum Lewisii</i>
Fireweed	<i>Epilobium angustifolium</i>
Venus's-slipper	<i>Calypso bulbosa</i>
Blunt-leaved orchid	<i>Habenaria obtusata</i>
Bracted orchid	<i>Habenaria viridis</i>
Common pink wintergreen	<i>Pyrola asarifolia</i>
Greenish-flowered wintergreen	<i>Pyrola viridis</i>
Cut-leaved anemone	<i>Anemone multifida</i>
Prairie crocus	<i>Anemone patens</i>
Tall larkspur	<i>Delphinium occidentale</i> var. <i>glaucum</i>
Meadow rue	<i>Thalictrum venulosum</i>
Wild strawberry	<i>Fragaria glauca</i> var. <i>virginiana</i>
Sleepyhead	<i>Gewm triflorum</i>
White meadowsweet	<i>Spirea betulifolia</i> var. <i>lucida</i>

Northern bedstraw

*Galium triflorum*

Indian paintbrush

*Castilleja miniata*

Meadow parsnip

*Zizia aptera*

Early blue violet

*Viola adunca*

#### Grasses

Pine grass

*Calamagrostis rubescens*

Hairy wild rye

*Elymus innovatus*

Compiled by Canadian Forestry Service, Northern Forest Research Centre,  
5320 - 122 Street, Edmonton, Alberta.

CHECKLIST OF INSECTS AND DISEASES OF THE  
KANANASKIS FOREST EXPERIMENT STATION  
AND SURROUNDING AREA

Insects

<u>Common Name</u>	<u>Latin Name</u>
Gray willow leaf beetle	<i>Pyrrhalta decora</i>
White-spotted sawyer	<i>Monochamus scutellatus</i>
Mourning cloak butterfly	<i>Nymphalis antioxa</i>
Poplar borer	<i>Saperda calcarata</i>
American ash beetle	<i>Gonioctena americana</i>
White-pine weevil	<i>Pissodes strobi</i>
Pine engraver	<i>Ips pini</i>
Spruce gall aphid	<i>Adelges lariciatus</i>
Yellow-headed spruce sawfly	<i>Pikonera alaskensis</i>
Spotted tussock moth	<i>Halisidota maculata</i>
Poplar serpentine miner	<i>Phyllocnistis populiella</i>
Northern pitch twig moth	<i>Petrova albicinctana</i>
Early aspen leaf curler	<i>Pseudexentera oregonana</i>
Black-headed budworm	<i>Acleris variana</i>
Larch sawfly	<i>Pristiphora erichsonii</i>

Diseases

Hypoxylon canker	<i>Hypoxylon marmatum</i>
Western gall rust	<i>Endocronartium harknessii</i>
Dwarf mistletoe	<i>Arceuthobium americanum</i>
Yellow witches' broom	<i>Chrysomyxa arctostaphyli</i>
Atropellis canker	<i>Atropellis piniphila</i>
Spruce needle rust	<i>Chrysomyxa ledicola</i>
Aspen shoot blight	<i>Venturia macularis</i>

White trunk rot	<i>Fomes igniarius</i>
Brown cubical rot	<i>Fomes pinicola</i>
Pine needle cast	<i>Elytroderma deformans</i>
Comandra blister rust	<i>Cronartium comandrae</i>
Stalactiform blister rust	<i>Cronartium coleosporioides</i>

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5320 - 122 Street, Edmonton, Alberta.