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The Trees and Forests of Waterton Lakes National Park

FOREST REGIONS

Within the park two of Canada's eight broad forest regions are represented. These are the sub-alpine and montane regions. There is also a third area, not strictly a forest region, but nevertheless supporting a limited number of trees. This is the prairie or grassland area, which penetrates the north central part of the park. The lower elevation prairies with their aspen groves merge in the park with the Douglas-fir, lodgepole pine, and white spruce of the montane region. These, in turn, give way to the higher elevation species of the subalpine region, the Engelmann spruce, whitebark pine, alpine fir, and alpine larch.

The boundaries between the three regions are generally not sharply defined and the more obvious changes in forest patterns which you will see are presented by the different species or combinations of species. The twelve stands depicted on this side of the chart are the commonest ones found in the park. Together they represent more than 95 percent of the forest land. For each stand only the dominant species are shown but lesser representations of other species are of times found in association.

FOR FURTHER READING

Native Trees of Canada
by R. C. Hosie
Published under the authority of the Minister of Fisheries and Forestry, Ottawa, 1969. 380 pages. Price : $5.00 (paper-bound) $8.00 (cloth-bound)
Available by mail from Information Canada, Ottawa, and at Information Canada bookshops across Canada. Also available from Canadian booksellers and public libraries.

Forest Regions of Canada
by J. S. Rowe
Published under the authority of the Minister of Environment, Ottawa, 1972. 172 pages. Price : $2.50
Available by mail from Information Canada, Ottawa, and at Information Canada bookshops across Canada.

Forest Types and Related Vegetation of Waterton Lakes National Park, Alberta, 1968
by N. Lopoukhine
Information Report FMR-X-28. 35 pages.
Available from Forest Management Institute, Environment Canada, Ottawa, Ontario K1A 0H3

Alberta, A Natural History
W. G. Hardy (Editor)
Published by M. G. Hurtig Ltd., Edmonton, 1967. 343 pages.

Perhaps part of your enjoyment of Waterton Lakes National Park will be a visit to its forests. A walk through the woods on mountain trails presents rewarding contrasts indeed to the city-bound existence that is, perforce, the lot of many of us. Perhaps, too, there could be added enjoyment for you in coming to know the trees and forests better. Should such be the case, it is hoped that this chart will serve at once as a guide and a souvenir.

The theme of Waterton Lakes National Park is "where the mountains meet the prairie," and the park certainly presents a unique opportunity for you to observe prairie grassland, forest-clad slopes, and mountain peaks soaring far above tree line. This transition, with its many-faceted vegetation patterns, is compressed into a distance of just a few miles.

The forest tree species (as distinct from shrubby types such as willow and alder which are not described here) differ with altitude. However, hard and fast boundary lines cannot be drawn because, at times, local factors of site, soil moisture, and soil type may permit a tree to grow at perceptibly higher or lower elevations than normal.

On the reverse of the chart, trees with similar foliage characteristics are described together and simple ways are noted for you to identify them. General information on the areas and elevations occupied by the various species is also given. Read the text, study the photographs and captions, then follow the map out into the park to see, identify, and enjoy the trees! As you travel, watch the ever-changing pattern of the forest.

Lodgepole pine
along the Nature Trail near Blakiston Falls

Alpine fir-Whitebark pine
Mother Duck Trail above Cameron Lake

Trembling aspen
Belly River Campground

Alpine fir
Mother Duck Trail above Cameron Lake

Spruce-Alpine fir
Mother Duck Trail close to Cameron Lake

Alpine fir-Lodgepole pine
along Akamina Parkway

Douglas-fir-Lodgepole pine
near Waterton Valley Viewpoint, on Highway 6.

Lodgepole pine-White spruce
near Belly River Bridge on Highway 6.

Alpine larch-Alpine fir
east of Cameron Lake

Poplar-Lodgepole pine
west of Blood Indian Reserve, Highway 6

Trembling aspen-White spruce
near Belly River Campground

Alpine larch
east of Cameron Lake

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There is, of course, more to the forest than simply trees, or these associations of trees. The forest is, in fact, a dynamic community of living things. A great number of species of animal life and lesser plants live out their life cycles within the forest confines. Hopefully, this chart may quicken a desire to learn more about the forest in this broader sense and, indeed, about other natural features of the park. The staff of Waterton Lakes National Park will always be pleased to help you. You are cordially invited to use the park information facilities and services and to participate in the special interpretive programs that are offered daily during the summer months.

Please treat the trees and forests with respect. Ponder for a moment, if you will, the pleasure they can give to future generations who in time may pass this way.

The Trees and Forests of Waterton Lakes National Park

The Pines and Alpine Larch

The three species of pine found in the park; lodgepole pine, limber pine, and whitebark pine, are readily distinguished from the other trees by their long, stiff leaves, or needles. With lodgepole pine, the needles come in clusters of two, whereas those of the limber pine and whitebark pine come in clusters of five.

Lodgepole pine is one of the commonest trees in the park. In pure stands it occupies about 20 percent of the forested land and, in combination with other trees, it covers almost as much again. Examples of this straight, slender tree can be found throughout the park up to elevations something in excess of 6,000 feet.

Limber pine is as difficult to find as lodgepole pine is easy. Isolated, low, scrubby trees, seldom exceeding 8 feet in height, grow at lower elevations along the flats and terraces of Blakiston Creek and on the west slopes of Ruby and Lakeview ridges.

Whitebark pine flourishes high on the mountains, ranging from about 5,500 feet up towards tree line. It prefers the warmer and drier sites of west-facing slopes, and in association with other trees it covers about 15 percent of the forested area.

The only other tree in the park bearing needle-like foliage in clusters is the alpine larch. However, there is little likelihood of confusing this tree with the pines because its needle clusters grow from the tips of distinctive dwarf twigs and each cluster contains 30 to 40 relatively short, flexible needles. In autumn these needles turn yellow and are shed completely. The alpine larch, a tree of the high mountain slopes, grows on the cooler, north-facing sites at elevations usually in excess of 6,000 feet. Alone, and with alpine fir, it makes up about 3 percent of the forest.

The Spruces and the Firs

Engelmann spruce, white spruce, and hybrids of these two species are the only spruces found in the park. Because of the shape and arrangement of their needles they are readily distinguished from the pines. Spruce needles are shorter than those of the pines, and instead of growing in clusters they are singly and spirally attached to small woody projections of the twigs. When the needles are shed, usually after 5 or more years, these peg-like projections remain to give the twig the uniformly knobby appearance characteristic of spruces.

True Engelmann spruce are found only at higher elevations in the park, usually above the 6,000-foot contour. True white spruce, on the other hand, normally grow below the 5,000-foot level. The two trees are very similar in general appearance and the best way to identify them is by a comparison of cone scales, that is, the fan-shaped, woody segments of the cone. The white spruce cone scale is stiff and has a smoothly rounded tip while that of the Engelmann spruce is flexible, more pointed, and is often finely toothed or notched.

The altitudinal ranges of the two spruces overlap somewhere between the 5,000- to 6,000-foot levels and in this area they interbreed to produce trees with a mixture of the characteristics of the parent species. These trees are best regarded simply as spruce hybrids.

Close to 20 percent of the forest contains spruce, growing mostly with other conifers. Spruce and alpine fir are commonly found together, and, at first glance, the foliage of the two trees seems similar indeed. However, the individual needles of spruce are four-sided in cross-section and roll smoothly between forefinger and thumb. Fir needles, on the other hand, are flattened and difficult to roll. When removed from the twig they leave small circular scars quite distinct from the pegs of the spruces. Another distinguishing feature is the cones which hang down on the spruces but are erect-growing on the alpine fir. At maturity all but the central core of the fir cone disintegrates and this distinctive upright spike remains on the tree at least until the following summer. The spruces also have rough, scaly trunks compared to those of younger alpine fir where the bark is smooth, lighter in colour, and prominently marked with raised resin blisters. However, use of this identifying feature must be approached with caution because, with age, alpine fir trunks become scaly and similar in appearance to the spruces.

The stately, spire-shaped alpine fir is a common tree in the park ranging upward from about the 4,500-foot level. In pure stands it accounts for some 13 percent of the forest and, in combination with the pines, the spruces, and alpine larch, it extends over a further 36 percent.

The Interior Douglas-fir found in the park is a shorter and more limby version of the renowned Coast Douglas-fir of British Columbia. Douglas-fir needles could easily be confused with those of alpine fir and, indeed, for some time the Douglas-firs were classified with the true firs because of this marked similarity of foliage. Fortunately, however, there are distinct differences in cones and terminal buds. The cones of the Douglas-fir hang down and prominent, three-pronged structures (bracts) are easily seen protruding from beneath the cone scales. Terminal buds on Douglas-fir are sharply pointed and non-resinous whereas those on alpine fir are rounded and resinous. After leaf fall, the twigs and branchlets of Douglas-fir are smooth which removes the chance of confusion with the spruces.

Douglas-fir is found over about 7 percent of the forest area, mostly in association with other conifers in the 4,300- to 5,500-foot range.

The Poplars and White Birch

With the exception of a few scattered examples of white birch, such as those located close to the Park Information Office, the poplars are the only broadleaved forest trees in the park. The creamy-white bark of the white birch may at times lead to confusion with one of the poplars, the trembling aspen, which is common in the park and, indeed, across most of Canada. At times the trembling aspen displays an almost pure white bark, but a moment's examination of the two trees will quickly sort out differences. The bark of the birch peels off naturally in thin, papery layers and it also has conspicuous, long horizontal markings called lenticels. The trembling aspen has neither of these features. Then, too, the bark of the twigs and younger branches of the birch have a pronounced dark reddish-brown colour that contrasts strongly with the rich whiteness of the trunk. With the aspen, the colour of twigs and small branches blends closely with that of the trunk.

The trembling aspen is most easily distinguished from other poplars in the park by characteristics of leaf and bark. Its leaf is almost circular in shape with an abrupt, short, sharp tip. But more singular is the leaf stalk which is markedly flattened. This imparts a notable instability to the leaf which will flutter in the lightest of breezes. It is this feature, of course, which led to the common name for the tree. The light green to white bark is typical of the tree in all but its more advanced years when the colour tends to grey and the lower parts of the trunk, particularly, become furrowed into long, flat ridges.

The remaining two poplars found in the park, balsam poplar and black cottonwood, are difficult to separate because of initial similarities of form and feature as well as further confusions arising from interbreeding. The leaves of true balsam poplar tend to be more oval to egg-shaped and its seed pods split into two segments to release the light, fluffy seed. With true black cottonwood, the leaves are, if anything, somewhat more playing-card-spade-shaped and the seed pods split in three directions. Leaf shape, a dubious means of separation at best, becomes practically meaningless when interbreeding occurs.

About 14 percent of the park's forests consists of poplar species and a further 4 percent is a mixedwood complex of poplars, lodgepole pine, and spruce. The balsam poplar and black cottonwood are limited to the lower elevations of the park but stunted specimens of trembling aspen are found as high as 6,000 feet.

LODGEPOLE PINE (*Pinus contorta* Dougl.)

Lodgepole pine is plentiful throughout the park especially on southwestern aspects. This tree was found along Highway 6 just east of the Belly River Bridge. *Parking just southwest of Belly River Bridge.*

Lodgepole pine is the only pine in the park whose needles come in clusters of two. They vary from 1- to 3-inches in length and are stiff and sharp pointed with toothed edges.

Cones are somewhat egg-shaped, from 1- to 2-inches long, and without stalks. They usually remain closed when mature and often persist on the tree for many years. Cone scales have thick outer ends and the tips carry a curved prickle which may be shed.

LIMBER PINE (*Pinus flexilis* James)

Within the park, limber pines grow only as isolated, stunted trees. They are found on flats and terraces close to the Blakiston Valley Plaque Turnout. *Parking at Blakiston Valley Plaque Turnout.*

Needles come in clusters of five and measure from 1½- to 3½-inches in length. They are stiff, slightly curved, smooth edged, and clustered towards the end of the branchlets.

The short-stalked cones are from 3- to 8-inches long and 1¼- to 2¼-inches wide. The green, immature cones turn yellow brown with maturity.

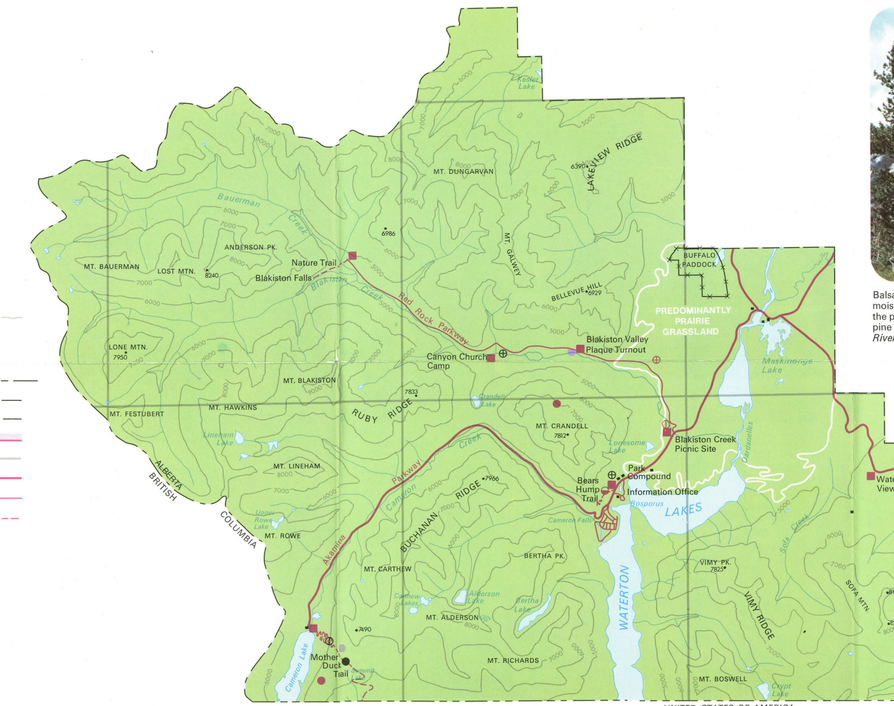
The scale tips of mature cones are often coated with whitish-coloured resin.

WHITEBARK PINE (*Pinus albicaulis* Engelm.)

Good examples of whitebark pine are found along the Mother Duck Trail near Summit Lake. It is the only pine growing in this area. Watch for the candelabrum-like arrangement of the upper branches. *Parking at Cameron Lake.*

Like the limber pine the needles are in clusters of five, from 1½- to 3½-inches long, stiff, slightly curved, smooth edged, and clustered towards the end of the branchlets.

The somewhat rose-shaped, globular cones have no stalks and are 1½- to 3-inches long. They are permanently closed and seed is released after they have fallen and decayed or been opened by birds or rodents. Immature cones are deep purple. At maturity the cone scale tips become lighter coloured.



- Lodgepole Pine
- Limber Pine
- Whitebark Pine
- Alpine Larch
- Engelmann Spruce
- White Spruce
- Alpine Fir
- Douglas Fir
- Trembling Aspen
- Black Cottonwood
- Balsam Poplar
- White Birch
- Building
- Contour
- Glacier
- Height in feet (•7682)
- International Boundary
- Interprovincial Boundary
- Park Boundary
- Indian Reserve Boundary
- Township Boundary
- Main road
- Local road
- Pack trail or path
- Non-perennial lake
- Parking

ALPINE LARCH (*Larix lyallii* Parl.)

About three-fourths of a mile southwest of Summit Lake off the Mother Duck Trail a prominent stand of alpine larch overlooks Cameron Lake. *Parking at Cameron Lake.*

Alpine larch is a tree of the higher elevations. Across the valley from the Blakiston Valley Plaque Turnout these light green trees are seen in the snow on the upper slopes of Mt. Crandell.

Needles are 1- to 1½-inches long and are soft and flexible. They grow in clusters of 30 to 40 from the tips of dwarf twigs and resemble miniature shaving brushes.

The cones, 1½- to 2-inches in length, have bracts with long, slender points which extend beyond the cone scales. Open cones have an overall ragged, crinkled appearance.

ENGELMANN SPRUCE (*Picea engelmannii* Parry)

At the top of the zig-zag portion of the Mother Duck Trail, right above Cameron Lake, are plentiful examples of Engelmann spruce. This area is above the normal range of white spruce and the spruce hybrids. *Parking at Cameron Lake.*

Needles are slightly curved, about ¾-inch long, and four-sided in cross-section. They roll easily between forefinger and thumb.

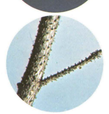
Cones range from 1- to 3-inches in length. Cone scales are flexible and loose fitting with somewhat pointed tips the perimeters of which are often finely toothed or notched.

WHITE SPRUCE (*Picea glauca* (Moench) Voss)

Good examples of white spruce are found at the Belly River Campsite off Highway 6. At this elevation (about 4,500 feet) there is no confusion with Engelmann spruce and spruce hybrids. *Parking at Belly River Campsite.*

White spruce needles are similar indeed to those of Engelmann spruce although they tend to be somewhat straighter.

Cones are about 2-inches long. The cone scales, in distinct contrast to those of Engelmann spruce, are stiff with broad, smoothly rounded tips.



Needles of the spruces are attached singly and spirally to small, woody projections of the twigs. The knobby appearance of leafless twigs distinguishes the spruces from the firs.

ALPINE FIR (*Abies lasiocarpa* (Hook.) Nutt.)

This tree is common through much of the park and is plentiful along the Mother Duck Trail from Cameron Lake to Summit Lake and beyond. *Parking at Cameron Lake.*

Needles are 1- to 1¾-inches long, rounded or notched at the tip, flattened, and difficult to roll between forefinger and thumb. Terminal buds are rounded and resinous.

Cones are cylindrical, erect growing and measure from 2½- to 4-inches in length. At maturity, scales and seeds fall away from the central core which persists as a prominent spike at least until the following summer.

Following needle fall, the twig bark is smooth with only small, circular scars to mark the point of needle attachment.

BALSAM POPLAR (*Populus balsamifera* L.)

Balsam poplar, a tree of the lower elevations and moist sites, is often found in the eastern parts of the park, sometimes in association with lodgepole pine or spruce. *Parking just southwest of Belly River Bridge.*

Leaves which range from 3- to 5-inches in length tend to be somewhat narrower than those of black cottonwood but this is not a positive identifying feature. The leaf stalk is rounded in cross-section as distinct from the trembling aspen.

In spring seed pods of balsam poplar split open two ways to release seed. Where interbreeding occurs with black cottonwood it is possible to find seed pods on the same stalk splitting either two or three ways.

WHITE BIRCH (*Betula papyrifera* Marsh.)

A short walk up the Bear's Hump Trail from the back of the Park Information Office leads to an area of scattered white birch trees. This tree is not common in the park. *Parking at Information Office.*

Birch leaves are triangular to egg-shaped and measure about 3½-inches in length. They are more oval and more deeply toothed than trembling aspen leaves.

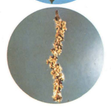
Older bark is creamy white in colour and peels readily. It has conspicuous, horizontal markings called lenticels.

Young trunks and young branches are a pronounced red-dish-brown colour.

BLACK COTTONWOOD (*Populus trichocarpa* Torr. and Gray)

Like balsam poplar this tree grows at lower elevations on wetter sites. Examples are found on the flats along the lower reaches of Blakiston Creek and at Blakiston Creek Picnic Site. *Parking at Blakiston Creek Picnic Site.*

Leaves range from 3- to 5-inches in length and tend to be broader than those of balsam poplar but this is not a positive identifying feature. The leaf stalk is rounded in cross-section as distinct from trembling aspen.



In spring seed pods of black cottonwood split open three ways to release seed. Where interbreeding occurs with balsam poplar it is possible to find seed pods on the same stalk splitting either two or three ways.

TREMBLING ASPEN (*Populus tremuloides* Michx.)

Trembling aspen is found over much of the park but is concentrated towards the eastern side. Good specimens are found at the Belly River Campsite. *Parking at Belly River Campsite.*

Groves of scrubby and stunted aspen grow around the foot of Bellevue Hill about one mile up the Red Rock Parkway from its junction with Highway 5.

Leaves are nearly circular, about 1½- to 2-inches across, with short, sharp tips. The flattened leaf stalk causes the leaf to flutter in the lightest wind.

Bark ranges from pale green to almost white. With age the lower trunk, particularly, becomes grey and furrowed into long, flat ridges.

DOUGLAS-FIR (*Pseudotsuga menziesii* var. *glauca* (Beissn.) Franco)

Behind the Park Information Office a trail parallels Highway 5 north towards the Park Compound. Along this route are scattered Douglas-fir and just to the west are several pure stands. *Parking at Information Office.*

Gnarled and stunted Douglas-fir grows along the flats and terraces of Blakiston Creek near the Canyon Church Camp.

Needles are flat and from ¾- to 1¼-inches long. As with alpine fir, they fall to leave the twig smooth to the touch. Terminal buds are sharp pointed and non-resinous.

Cones are usually less than 3-inches long and hang downwards from stout stalks. Three-pronged bracts protruding beyond the cone scales provide positive identification.