The Foothi

The foothills area is a unique zone of natural forested wildland along the eastern slopes of the Rocky Mountains. The foothills extend northward from the international boundary for approximately 650 km, are some 24 km to 65 km wide, and occur between the altitudes of 1,000 m and 1,900 m. To the west they nestle against the high, rugged, intensely folded Rocky Mountains, and to the east they confront the productive agricultural plains of the prairies or blend into the boreal forest.

The foothills form the eastern front of the southern part of the cordilleran physiographic region of Canada. They rise abruptly above the interior plains of western Alberta where the Mesozoic and Tertiary sandstones, shales, conglomerates, and coals of the plains were tilted and folded into a series of long ridges and hills aligned in a northwestern to southeastern direction. In the south, very closely spaced thrust faults are characteristic, whereas in the central and northern foothills, open and tight folds are more typical. The sandstone bedrock is often exposed along the ridge tops, but elsewhere it is covered by a thin glacial till. Despite glaciation, ten to twelve thousand years ago, the basic relief of this region has remained largely unchanged. Many of the mountain rivers cross the foothills in valleys widened or deepened by glaciers, or have cut canyons into the softer shales and argillaceous sandstones, producing characteristic steep-sided valleys. Streams originating in the foothills are relatively small. They have a greater variation in annual flow, an earlier peak, and a greater tendency to flood than do glacier-fed mountain rivers.

Soils in the foothills north of the Bow River are gray wooded, with localized areas of organic soils near the eastern margin. South of the Bow River, soils grade into the dark gray wooded and black soils more typical of the parkland portion of the province.

The climate is intermediate between that of the plains to the east and the higher elevations to the west, with short moderately warm summers and long relatively cold winters. Topography causes many variations. July is the warmest month, with a mean temperature of about 13° C, and June is the wettest month, with 10 cm of precipitation, although the northern foothills may be equally wet in July. About 70 per cent of the 510 cm to 610 cm of annual precipitation occurs in the summer months, May to September. The frost-free period ranges only between 60 and 80 days. Evaporation is low, and the water surplus from the eastern slopes is very important, providing up to 90 per cent of the water needs for downstream areas with a deficiency. Warm chinook winds occur commonly, removing much of the snow cover and thereby enhancing rangeland cattle operations, especially in the more southerly foothills.

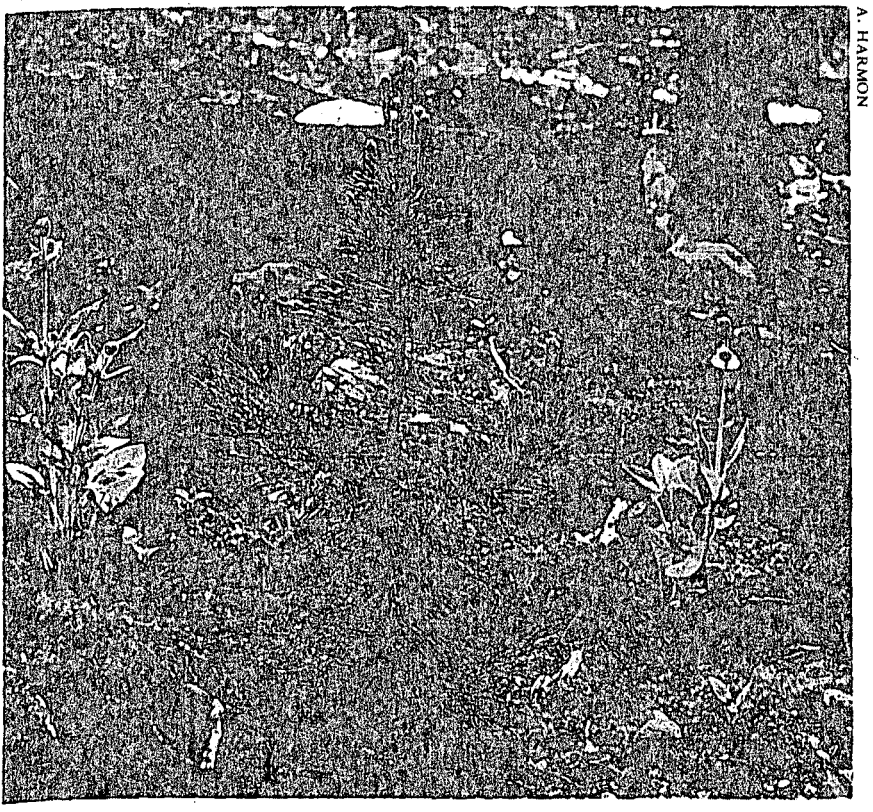
The vegetation is dominantly coniferous forest with localized grassland-forest transition zones, especially in the southern foothills. Extensive areas of

LEFT
Forest fires started by lightning or man greatly change foothills and boreal forests

OPPOSITE
Lodgepole pines quickly appear after foothills fires.

trembling aspen or aspen-willow scrub vegetation extend southward from the Bow River, where grazing is a dominant land use. Elsewhere, lodgepole pine and white spruce are dominant trees, especially on the better-drained upland sites. Below about 1,200 m, trembling aspen, balsam poplar, and paper birch are present and are locally important. North of the Red Deer River, black spruce is a frequent species on the wetter sites and tamarack occurs sporadically, generally at lower elevations. In the southern foothills, south of the Bow River, the montane forest zone is characterized by Douglas fir, lodgepole pine, white spruce, and aspen. Limber pine may also occur in this zone on rocky exposed outcrops. The undergrowth throughout much of the foothills commonly includes Labrador tea, willows, green alder, prickly rose, junipers, buffaloberry, bearberry, blueberry, arnica, showy aster, palmate-leaved coltsfoot, wintergreen, tall lungwort, bunchberry, twin-flower, red paintbrush, fireweed, hairy wild rye and reed grass, various feather mosses, and the lichens *Cladonia* and *Peltigera*. Yellow mountain avens is common on the gravel along streams and on outwash areas.

Fire has played a major role in the development and maintenance of the forest environment of the foothills. Frequent fires of varying intensity have



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greatly influenced the composition of the forests by preventing the establishment of a stable climax vegetation type over much of the area. Stands over one hundred and fifty years old are rare, especially in the low foothills where pine and aspen compete as pioneer species following a fire. Aspen has an initial advantage through its prolific root suckering, but pine overtakes the aspen within fifty years, and aspen decadence becomes effective after about a hundred years. By this time, if spruce is present, it may have attained a position of co-dominance with the pine. In the high foothills, aspen is generally absent and pine is the main pioneer, although there are usually islands of spruce and subalpine fir which have escaped the fire. Fire aids the spread of lodgepole pine stands, as the resinous bonding of the cones allows seed to survive fire; high temperatures then break down the bonding, freeing the seeds, which germinate to produce dense, even-aged stands. Spruce and fir, unlike the pine, must rely on wind dispersal of seeds from residual trees in order to spread into burned areas.

Excellent habitat for many fish and wildlife species exists throughout the foothills. Large mammals, such as the black bear, cougar, coyote, lynx, moose, and white-tailed and mule deer, are widespread or locally distributed. Wapiti,

mountain sheep, caribou, wolf, and grizzly bear are locally present in some areas where habitat requirements are met. Several species of grouse occur in varying numbers. This is not an important area for waterfowl, although some breed here or pass through the foothills. Rainbow trout occur naturally in the Athabasca river basin, cutthroat trout in the Bow and Oldman river basins, and arctic grayling in the Athabasca and Smoky river basins. Some of these species have been introduced outside their natural range, as have the brown and brook trout to the central foothills.

Most of the foothills lie within the Green Zone, a management unit established by the Alberta Forest Service in 1948, which includes those forested lands not available for agricultural development other than grazing. The present policy is to manage these public lands for the multiple or integrated use of both renewable and nonrenewable resources. The management of the area to protect the water resource for downstream uses has been given priority over all other uses for a long time, especially in the South and North Saskatchewan River drainages. Approximately a sixth of the region remains uncommitted crown lands but the rest has various types of use dispositions. Some 5 per cent of the area has been indefinitely committed; this includes wilderness and park areas, federal lands such as Indian reserves, and privately owned land, mainly in the transportation corridors. About 50 per cent of the area has been committed for long-term nonrenewable uses such as oil, natural gas, and coal developments; and about 15 per cent for short-term nonrenewable uses, primarily mineral exploration. Long- and short-term renewable resource commitments include timber management quotas and agreements, and grazing allotments. Other uses of the area are for wildland recreation such as hiking, photography, nature study, skiing, camping, hunting, and fishing; tourism; and to a limited extent urbanization, especially in the transportation corridors. Management of the land for timber, beef, or minerals can have profound effects on the fish and wildlife resources and on the enjoyment of recreational activities based on the wilderness or natural environment. There is, therefore, considerable potential for conflicting land use assignments. However, many conflicts may resolve themselves through geographical separation, may be made more compatible by suitable planning, or may have their adverse environmental effects minimized. New policies and regulations of government will, one hopes, help to reconcile the conflicts between the major use patterns of the foothills and preserve much of the area in a natural state.

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Further Reading

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