



REDSTREAK

# RESTORATION



Parks  
Canada

Parcs  
Canada

Canada

*Ecological restoration is the process of assisting the recovery of damaged ecosystems. The ecological restoration movement is taking hold in a variety of locations-parks, cities, coastlines, wetlands and grasslands. The work being done here is known as fire maintained ecosystem restoration. Similar projects can be found wherever frequent fire has been a traditional element in the landscape-dry forests in British Columbia, native prairies in Alberta and Ontario, even in savanna forests in the State of Florida!*

*Prior to European settlement in the Columbia Valley, the fire regime was a combination of lightning caused and human caused fires. First Nations used fire as a land and resource management tool, which they employed for a number of specific purposes. Enhancing forage for deer, elk and wild sheep was a primary use; boosting the productivity of specific berry or root crops was another.*

RESTORING ~~THE~~

## LANDSCAPE

*Through dendrochronology (the science of dating annual tree rings) and the study of tree fire scars, we can determine the pre-settlement fire return interval-the number of years between fires on the same site. In some cases we can also determine the actual season of the fire.*

*In the dry forests of the Columbia Valley, this interval typically ranged between five and 35 years between fires. Because of modern fire suppression, many of these stands have not experienced fire for sixty, eighty or even a hundred years.*

*"The Kootenay River...flows through a fine valley, with extensive meadows on the bottom, and flats and benches on either side, covered with very fine bunch grass, and generally timbered with scattered red pine and larch of a large growth."  
from Walter Moberly, 1864*

*"The country over which we rode [near Invermere] was terraced, undulating ground. [The terraces] are quite uniform, of even surface, and covered with bunch grass and sage brush, being quite free from boulders, while here and there a few scattered pines relieve the yellow bareness so characteristic of this district."  
from Mrs. Algernon St. Maur, 1890*

*When fire's natural thinning process is removed from dry forests, young Douglas-fir seedlings take hold by the thousands. The seedlings grow quickly, but once they reach pole size, they begin competing for sunlight, water and nutrients. Tree growth in the entire forest slows down dramatically, and the weakened trees become targets for insects and diseases.*

*As you walk through the forests of the Columbia Valley, you will often see the old, decaying stumps of large trees, scattered here and there. These are the remnants of the original forest. A common early logging practice was called "highgrading," where only the largest, healthiest Douglas-fir, larch and ponderosa pine trees were cut down.*

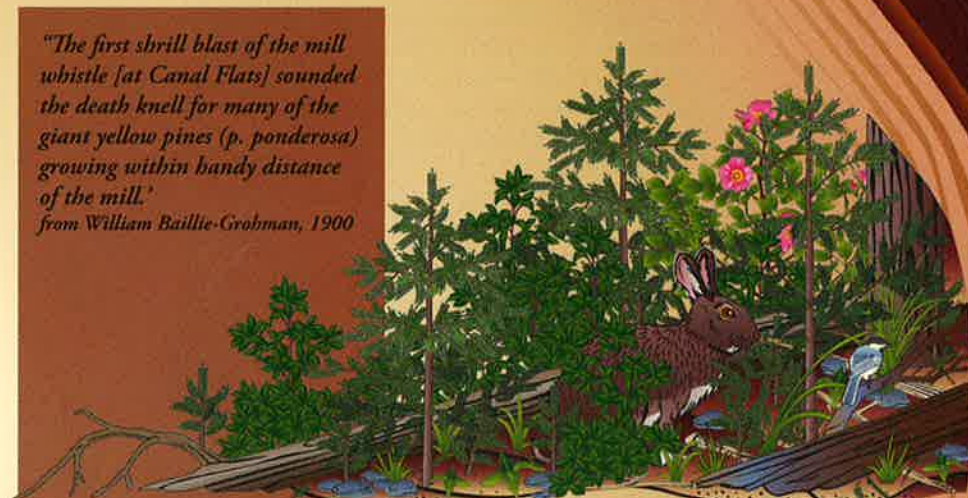
*In the dry forests of the Columbia Valley, early highgrade logging and modern fire suppression have combined to produce the dense, young and unnatural forest stands we see today.*

TOO MANY

## TREES

*The balance between forest and grassland is always changing, due to fluctuations of climate. However, fire suppression has dramatically shifted the balance in favour of forests, as tree seedlings establish in areas that were traditionally open grassland.*

*"The first shrill blast of the mill whistle [at Canal Flats] sounded the death knell for many of the giant yellow pines (p. ponderosa) growing within handy distance of the mill."  
from William Baillie-Grohman, 1900*



All forests accumulate fuel, in the form of live and standing dead trees (aerial fuels) and ground fuels in the form of downed trees, branches, needles and bark. In wet forests, microbes quickly break the ground fuels into humus, which is not very flammable. In dry forests however, microbes are much less active, so flammable woody fuels accumulate. The job that microbes do in wet forests is normally performed by fire in dry forests, keeping ground fuel accumulation at reasonable levels.

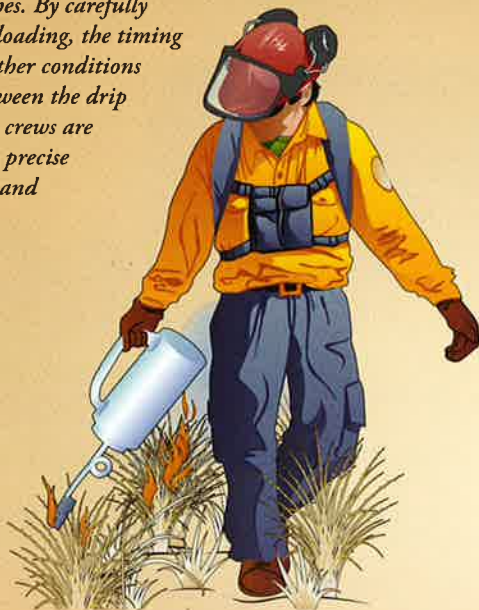
Commercial forest thinning targets the larger, market-sized trees. A restoration thinning does the reverse, removing the smaller trees. Foresters sometimes refer to this as "thinning from below."



TAKING

## ACTION

Prescribed burns are usually started using hand-held drip torches. By carefully monitoring the fuel loading, the timing of the burn, the weather conditions and the distance between the drip torch ignition strips, crews are able to achieve quite precise control over the size and intensity of the prescribed fire.



Trees vary dramatically in their resistance to fire. Ponderosa pine is probably the most resistant to fire, followed closely by Douglas-fir and larch. Cedars, spruce, true firs and juniper are readily consumed by fire. Aspen has little fire resistance, but generally endures fire by resprouting from underground stems. Lodgepole and its close relative, jack pine, have a curious relationship with fire. They are very easily killed by fire, and yet they require fire in order to establish and grow. Grasses, flowers and shrubs can be consumed by fire, but unless the fire is extremely hot, most can regrow or reseed themselves.

FIRS AND

## FIRE

Grasses, flowers and shrubs have different sunlight requirements. A few examples of sun-loving plants are bluebunch wheatgrass, arrowleaf balsamroot and Saskatoon berry. Many of the sun-loving plants provide the right nutritional balance for wild sheep, deer and elk. As forest ingrowth proceeds and increasing tree cover shades the ground, these and other important plants will eventually drop out of the ecosystem. The loss of these plants may trigger a "cascade" effect, as other mammals, birds and insects that rely on these plants also begin to disappear.



## BIGHORN

# SHEEP

*Wild sheep are easily outrun by predators such as cougars and coyotes. They rely on a combination of good eyesight and the clear sightlines of open grasslands, to provide early warning of the approach of predators. Ideal sheep terrain consists of open grasslands close to steep, rocky "escape" terrain. Research has shown that ingrown grasslands and forests not only reduce the forage available to wild sheep, but increase mortality due to predation as well.*



## THE

# FUTURE

*Fires are natural disturbance events, along with floods, snow avalanches, beetle invasions, windstorms and so on. Although they can be quite destructive from our point of view, nature has not only adapted to, but actually relies on a certain level of natural disturbance, to maintain healthy ecosystems. We tend to think of an ecosystem as a collection of certain animals and plants, but in reality the set of local disturbance processes and events--like fire--are equally important in defining an ecosystem. In order to be good stewards of our Park ecosystems, we must understand and work with fire and other natural disturbance events.*