

Cranbrook site map

One area of forest has been thinned so that the distance between trees is 4 meters (see map). Another area has been thinned to 5 meter spacing. Data are collected within the treated areas and, for comparison, in unthinned forest and in a nearby area that was clearcut at the same time.

Stands were thinned in the winter of 1992 - 1993. Seedlings of four tree species (western larch, Douglas-fir, Engelmann spruce and ponderosa pine) will be planted in the experimental plots, and some areas will be fertilized.

This research project is a joint undertaking of the following organizations:

Canadian Forest Service  
 British Columbia Forest Service  
 Galloway Lumber Co. Ltd.  
 Crestbrook Forest Industries Ltd.  
 Forest Engineering Research Institute of Canada

For further information, please call:

Canadian Forest Service  
 Pacific Forestry Centre  
 Victoria  
 (604) 363-0765

British Columbia Forest Service  
 Cranbrook Forest District  
 426-1700

## Modifying Silvicultural Systems to Reduce Mountain Pine Beetle Hazard in Lodgepole Pine



Partnership Agreement on Forest Resource Development: FRDA II

Canada

BC

## Background

- Mountain pine beetle is the most destructive insect of mature pine forest in British Columbia. During periodic outbreaks, lodgepole pine trees are killed on large areas.
- During a major outbreak, affected areas are usually clearcut to salvage timber, reduce fire hazard or prevent spread of the insects to other pine stands.
- In addition to causing loss of valuable timber, major outbreaks disrupt long-term harvest planning, making it more difficult to manage the forest for recreation, wildlife and other resource values.

## Thinning and fertilization protect stands

- Healthy, vigorous trees are more able to resist attacks by mountain pine beetle. Thinning mature pine stands, leaving the strongest trees, reduces risk of major outbreaks. Fertilization can also help by increasing vigour of the remaining trees.
- Thinning opens the stand and alters patterns of air movement, humidity, temperature, and light conditions within the stand making it less favourable for beetles.
- Because thinning and fertilization help to protect mature pine stands, more reliable harvest scheduling is possible. This allows protection of important recreation, wildlife and scenic areas as well as a more secure timber supply.

## What about the next forest?

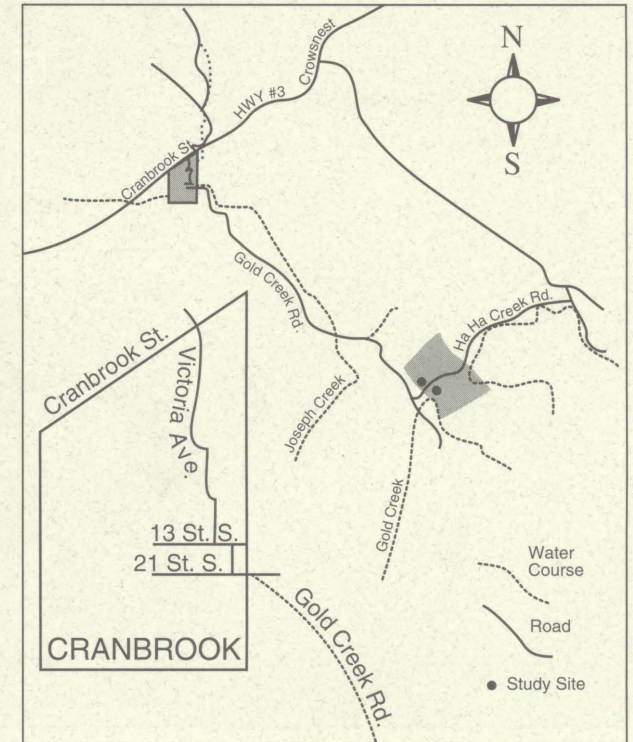
When a mature pine forest is opened by thinning, more light reaches the forest floor, providing a good environment for natural regeneration – or underplanting. When the remaining mature pine are harvested 10 to 20 years later, these young trees will remain to form the next forest. This way of regenerating a forest is called a "shelterwood" silviculture system.

The Kootenays are well suited to the growth of many tree species in addition to lodgepole pine. Underplanting with a mix of tree species for the next forest may:

- reduce the impact of future mountain pine beetle outbreaks if they occur;
- provide more options for managing the area; and,
- allow diversity of future wood products.

A site near Cranbrook is one of the three locations in the Nelson Forest Region chosen for a research and demonstration project to provide forest managers with the information needed to apply these forest practices.

The existing forest in this area is mostly lodgepole pine about 80 years old. Douglas-fir and larch stumps from past logging, and fire-scarred trees are present.



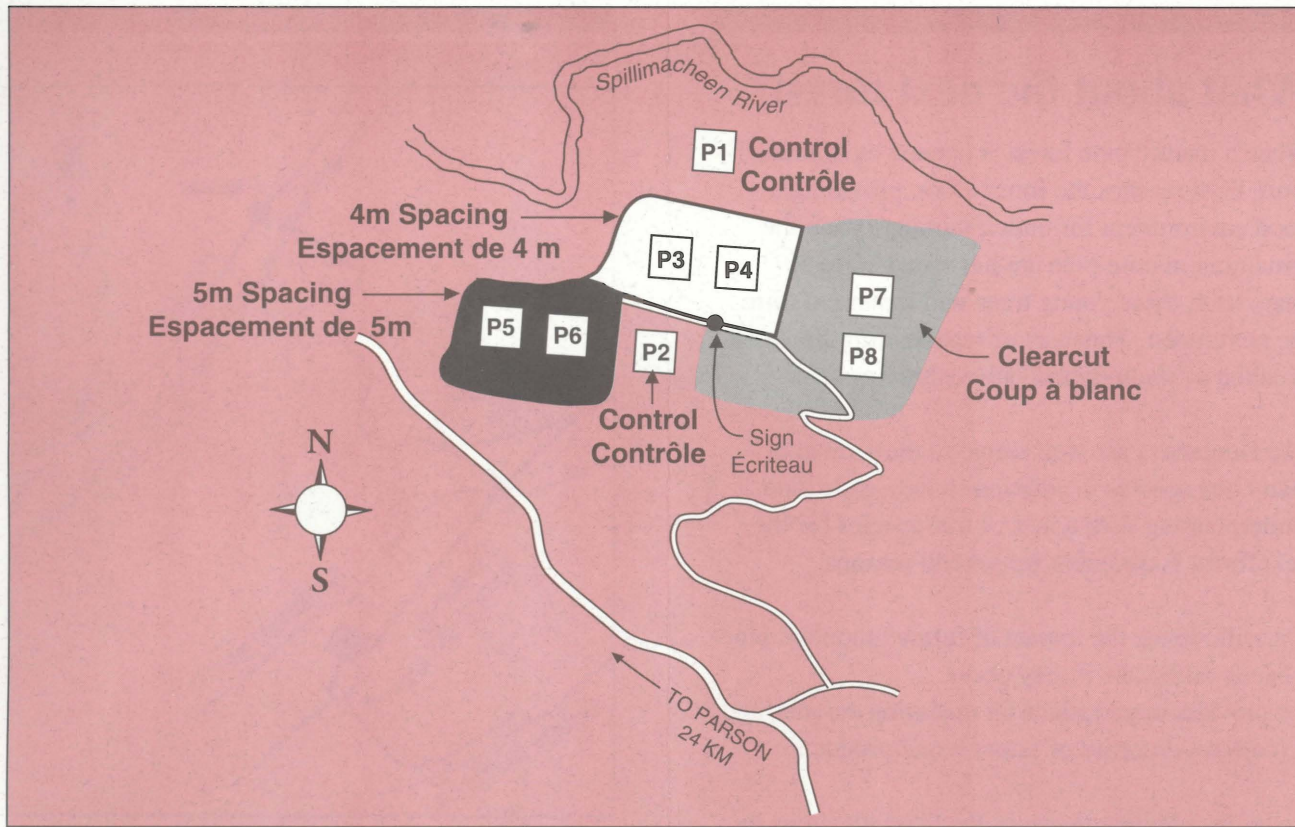
*How to get there*

## The Project

This research project will determine the operational constraints and economic feasibility of two levels of thinning. It will also document the effects of thinning and fertilization on:

- susceptibility of the stand to insect attack
- climate within the stand
- growth, condition and health of remaining trees
- establishment and growth of underplanted seedlings
- amount and type of understory plants

## Modifying Silvicultural Systems to Reduce Mountain Pine Beetle Hazard in Lodgepole Pine



*Parson site map*

One area of forest has been thinned so that the distance between trees is 4 meters (see map). Another area has been thinned to 5 meter spacing. Data are collected within the treated areas and, for comparison, in unthinned forest and in a nearby area that was clearcut at the same time.

Stands were thinned in the winter of 1993 - 1994. Seedlings of four tree species (western larch, Douglas-fir, Engelmann spruce and lodgepole pine) will be planted in the experimental plots, and some areas will be fertilized.

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## Background

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- After a major outbreak, affected areas are usually clearcut to salvage timber, reduce fire hazard or prevent spread of the insects to other pine stands.
- In addition to causing loss of valuable timber, major outbreaks disrupt long-term harvest planning, making it more difficult to manage the forest for recreation, wildlife and other resource values.

## Thinning and fertilization protect stands

- Healthy, vigorous trees are more able to resist attacks by mountain pine beetle. Thinning mature pine stands, leaving the strongest trees, reduces risk of major outbreaks. Fertilization can also help by increasing vigour of the remaining trees.
- Thinning opens the stand and alters patterns of air movement, humidity, temperature, and light conditions within the stand making it less favourable for beetles.
- Because thinning and fertilization help to protect mature pine stands, more reliable harvest scheduling is possible. This allows protection of important recreation, wildlife and scenic areas as well as a more secure timber supply.

## What about the next forest?

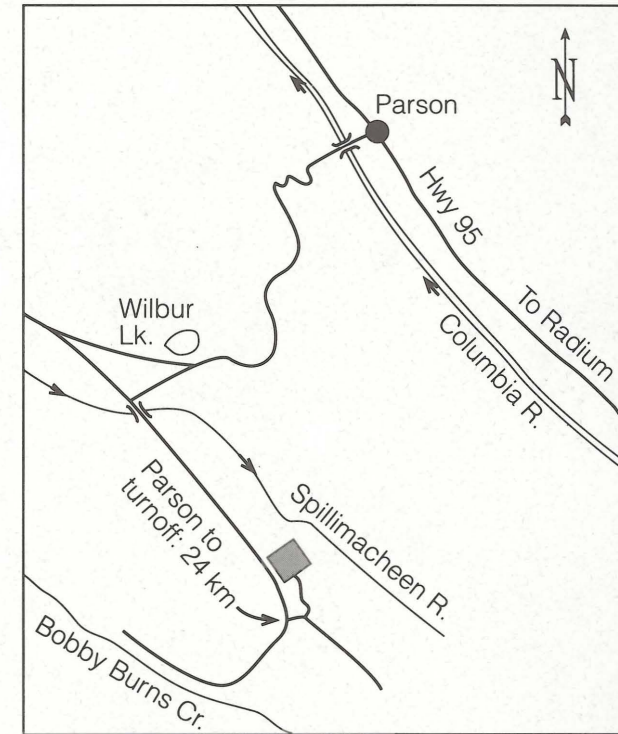
When a mature pine forest is opened by thinning, more light reaches the forest floor, providing a good environment for underplanting. When the remaining mature pine are harvested 10 to 20 years later, these young trees will remain to form the next forest. This way of regenerating a forest is called a "shelterwood" silviculture system.

The Kootenays are well suited to the growth of many tree species in addition to lodgepole pine. Underplanting with a mix of tree species for the next forest is desirable for several reasons:

- it will reduce the impact of future mountain pine beetle outbreaks if they occur;
- it provides more options for managing the area; and,
- it allows diversity of future wood products.

A site near Parson is one of the three locations in the Nelson Forest Region chosen for a research and demonstration project to provide forest managers with the information needed to apply these forest practices.

Existing forest is located on a level, terraced site at an elevation of 1100 m. Lodgepole pine is the dominant tree species, about 85 years old. Douglas-fir, hybrid spruce and subalpine fir are present.

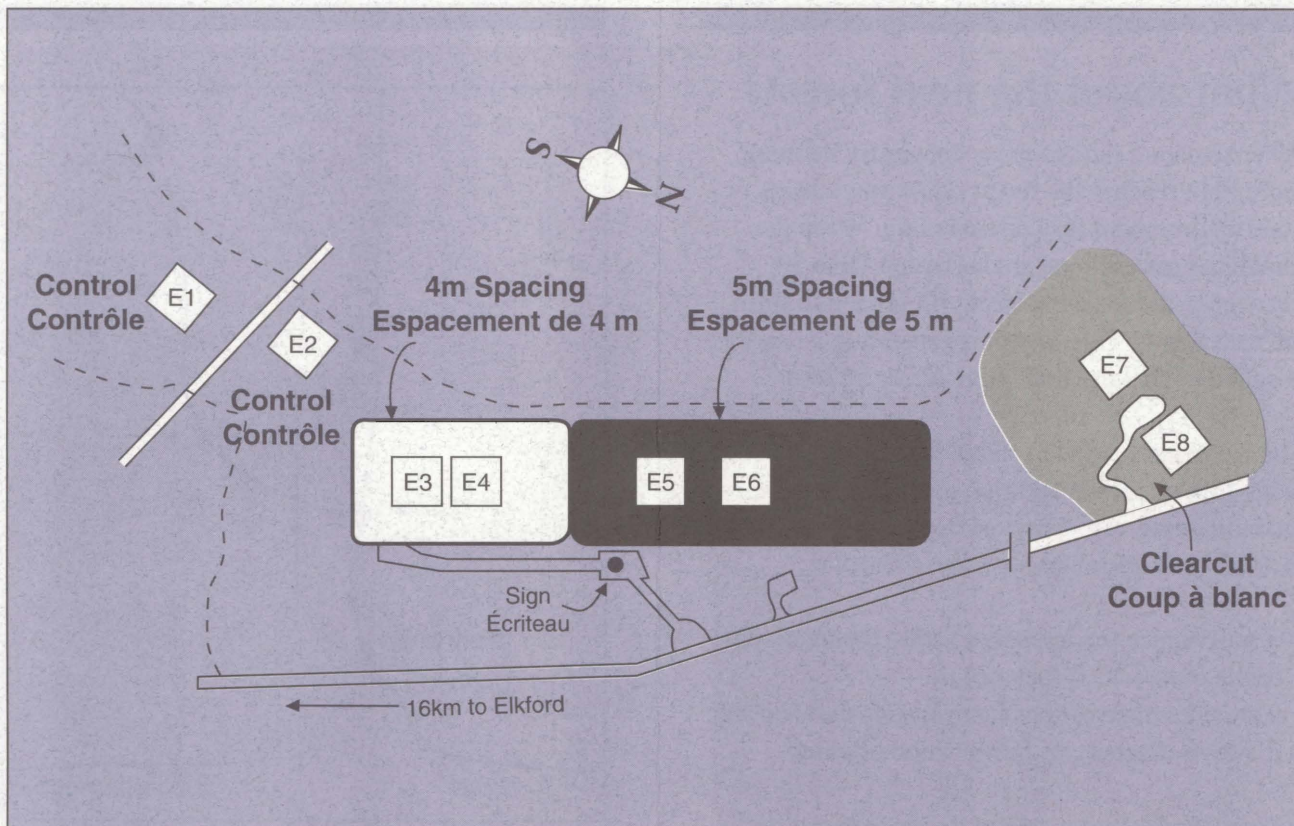


*How to get there*

## The Project

This research project will determine the operational constraints and economic feasibility of two levels of thinning. It will also document the effects of thinning and fertilization on:

- susceptibility of the stand to insect attack
- climate within the stand
- growth, condition and health of remaining trees
- establishment and growth of underplanted seedlings
- amount and type of understory plants



*Elkford site map*

One area of forest has been thinned so that the distance between trees is 4 meters (see map). Another area has been thinned to 5 meter spacing. Data are collected within the treated areas and, for comparison, in unthinned forest and in a nearby area that was clearcut at the same time. Stands were thinned in the winter of 1992 - 1993 and some areas will be fertilized.

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## What about the next forest?

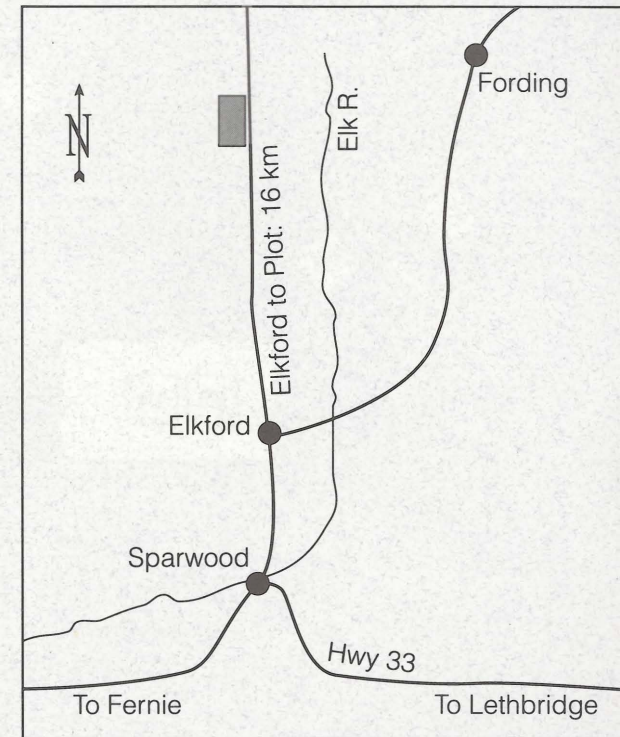
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- it will reduce the impact of future mountain pine beetle outbreaks if they occur;
- it provides more options for managing the area; and,
- it allows diversity of future wood products.

A site near Elkford is one of the three locations in the Nelson Forest Region chosen for a research and demonstration project to provide forest managers with the information needed to apply these forest practices.

Existing forest is mostly along a southerly facing slope at an elevation of 1450 m. Lodgepole pine is the dominant tree species, about 110 years old. Hybrid spruce, subalpine fir and western white pine are conspicuous.



*How to get there*

## The Project

This research project will determine the operational constraints and economic feasibility of two levels of thinning. It will also document the effects of thinning and fertilization on:

- susceptibility of the stand to insect attack
- climate within the stand
- growth, condition and health of remaining trees
- amount and type of understory plants