INGERSOLL CREEK
WESTERN WHITE PINE DEMONSTRATION AREA
1987 PROGRESS REPORT

by

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FOREWORD

This report is one of a series of internal reports distributed by Forest Protection Branch, B.C. Ministry of Forests, to record accomplishments and interim or provisional results for the information of staff, colleagues, and others.

In the Canada-British Columbia Forest Resources Development Agreement (FRDA) 1985 to 1990, over 100 pest control projects were directly funded by the province and administered by protection staff. To facilitate application of the results, and development of improved forest health management strategies, the contractors reports have been edited and distributed as internal reports. Accordingly, any opinions and recommendations expressed are those of the contractor, and not necessarily those of the ministry or the FRDA management committee.

For details or more information about the report or project, please contact forest health staff at Protection Branch or at the forest region offices.

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The guidelines for internal reports outlined in the Protection Manual were adhered to as closely as possible. All manuscripts were altered to comply with a common format, but entire reports were not rewritten to conform to a standardized outline.

Most Executive Summaries were the work of Graham Hawkins of MoF Inventory Branch (formerly with Pacific Coast Forest Biology). All word processing was accomplished by Catriona Kaufman of Top Kat Services. Will Gordon of R. White Woods inc. prepared all maps and figures.

R. White, editor
R. White Woods inc.

EXECUTIVE SUMMARY

This project was initiated, in part, due to the recommendations resulting from previous work performed on this 1.5ha site (PM-PB-48). Intensive management of the Ingersoll Creek Demonstration Area was conducted to enhance production of more desirable western white pine genotypes resistant to blister rust (*Cronartium ribicola*). The area boundaries were permanently marked and the site was hand-spaced to remove all species other than western white pine wherever possible. Slash was hand-piled throughout the site to reduce disturbance. All competing vegetation was removed near the bole of known bark reaction trees and these trees were then fertilized by hand. Spacing treatment was performed in order to enhance further spread of blister rust spores and possibly expose more bark reactions in the stand. In addition, thinning, combined with fertilization, would probably accelerate growth, flower production and cross-pollination of the desirable white pine genotypes.

Cones were collected from the parent tree for inclusion in the Forestry Canada inoculation trials. Seed from the on-site veteran white pine was sown for 1990 outplanting in the demonstration area. Flower and pollen production on the bark reaction trees and parent tree was monitored and pollen was collected from the veteran and parent trees for a white pine pollen bank. Ribes plants were planted within the area to increase inoculum levels in order to expose additional bark reactions and place selective pressure on the stand.

The objectives of the project were to perform detailed, intensive management of the demonstration area, which contains six active bark reaction trees plus the probable parent tree. Primarily, management of the site was to encourage western white pine to produce cone, pollen and seed in order to preserve a possible resistant cultivar.

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1 INTRODUCTION

In 1986, Ingersoll Creek White Pine Demonstration Area was established to preserve six active bark reaction western white pine (*Pinus monicula*) trees, plus the probable parent tree (Table 1, Figures 1 and 2). To enhance the stand toward the production of more desirable genotypes, intensive management of 1.5 hectares was conducted in 1987. Several photographs of active bark reaction trees were taken and are on file with the regional pathologist in Nelson.

2 MATERIALS AND METHODS

Initial activities were to space the 1.5 hectares, removing all species except western white pine. Where western white pine trees were absent, other species were left at a 4m spacing to prevent large openings. Trees that were spaced were cut into one to two metre sections and hand-piled into numerous piles spread throughout the 1.5 hectares. An extremely dry fall prevented burning of the piles and examination in the spring of 1988 will assess the viability of this management option. With the present slash, volume burning may endanger surrounding crop trees and negate the benefits of a totally clear site.

Opening of the stand should accelerate tree growth, flower production and cross-pollination of the more desirable western white pine genotypes remaining. Spacing will increase selection pressure (refer to PM-PB-47 spacing and pruning trial at Halfway River), and be advantageous by infecting more trees and increasing the chances of exposing more bark reactions.

After spacing and piling, a reconnaissance of the treated stand detected an additional bark reaction tree and one tree with a typical diamond shape canker, though no pitching or dead cambium tissue were detectable over the last two field seasons. This particular tree (No. 9) should be monitored over the succeeding years to detect possible tolerance.

All bark reaction trees were fertilized with 350-450g of NH_4NO_3. All competing vegetation was cleared from tree bole to 2m beyond the drip line. Fertilizer was hand-spread and raked into mineral soil. This cultural treatment should be carried out yearly to promote vigour and cone production for the basis of obtaining vegetative material for advanced breeding programs. Wire bands were also secured at the base of limbs at mid-crown on Tree No. 3 and Tree No. 4 to promote pollen production in succeeding years.

Fifteen cones were collected from the western white pine veteran by cone bagging in the spring and collection in late fall when seed was fully mature. Seed was extracted and cleaned and will be sent to the United States Forest Service Coeurd'alene Nursery for progeny rust inoculation testing.

The following activity schedule is proposed for 1988:

January 1988:	Obtain phytosanitary certificate to send seed from western white pine veteran to Coeurd'alene Nursery for February 1988 stratification and inclusion in 1989 Cycle VII rust inoculation.
April 1988:	Sow western white pine veteran seed for outplanting in demonstration area in 1990.
Spring 1988:	Monitor flower and pollen production on bark reaction trees. Tree No. 9094 should produce pollen as it did in 1987.
June 1988:	Collect pollen from tree No. 9094 and the western white pine veteran for inclusion in pollen bank.
June 1988:	Make controlled cross between tree No. 9094 and the western white pine veteran.
August 1988:	Fertilize bark reaction trees.
September 1988:	Take pictures of bark reaction cankers for annual photograph diary.
Sept.-Oct. 1988:	Transplant more Ribes plants in designated location within demonstration area (increase inoculum).

TABLE 1 ACCESS TO BARK REACTION TREES

Key Starting Point:	White Pine Veteran: From junction of Branch 7 and Whatshan Road, go South on Branch 7 - 80m to Tie Point (11cm birch) East side of road. White pine veteran is due West 45m. Tree specs: Age - 115 years, Height - 25m, Diameter - 33.9cm
Bark Reaction Tree No. 1:	From white pine veteran candidate tree is 17m, 172°. Tree specs: 23 years, 8.5m height, 8.8cm diameter. Canker activity: 1/4-1/2 basal canker, vertical canker growth curtailed, spotty marginal rust activity, light pitching, 3 inactive limb cankers.
Bark Reaction Tree No. 2:	From white pine veteran candidate tree is 32m, 228°. Tree specs: 23 years, 6.8m height, 5.5cm diameter. Canker activity: 1/4 bole canker at 25cm, spotty marginal rust activity, no other cankers, little pitching.
Bark Reaction Tree No. 3:	From white pine veteran candidate tree is 31m, 240°. Tree specs: 23 years, 9.1m height, 10cm diameter. Canker activity: 1/2 bole canker at base, vertical rust activity curtailed, spotty marginal rust activity, no other cankers, moderate pitching.
Bark Reaction Tree No. 4:	From white pine veteran candidate tree is 20m, 306°. Tree specs: 23 years, 7.7m height, 8cm diameter. Canker activity: At base 1/4 bole canker, vertical rust activity curtailed. Spotty marginal activity, light pitching.
Bark Reaction Tree No. 5:	From white pine veteran candidate tree is 10m, 344°. Tree specs: 21 years, 6.3m height, 7.5cm diameter. Canker activity: At base 1/4 to 1/2 bole canker, vertical activity curtailed, spotty marginal activity, moderate pitching.
Bark Reaction Tree No. 6:	From junction of Branch 7 and Whatshan Road go North on Whatshan Road - 140m to Tie Point (5cm birch) West side of road. Candidate tree is 30m, S88W.
Bark Reaction Tree No. 9094:	From junction of Branch 7 and Whatshan Road go North on Whatshan Road - 140m to Tie Point (5cm birch) West side of road. Candidate tree is 20m, S78W.
Bark Reaction Tree No. 8:	From white pine veteran candidate tree is 31m, 235°. Tree specs: 23 years, 9.8m height, 10.2cm diameter.
Bark Reaction Tree No. 9:	From white pine veteran candidate tree is 20m, 350°.

FIGURE 1 BARK REACTION TREE LOCATIONS

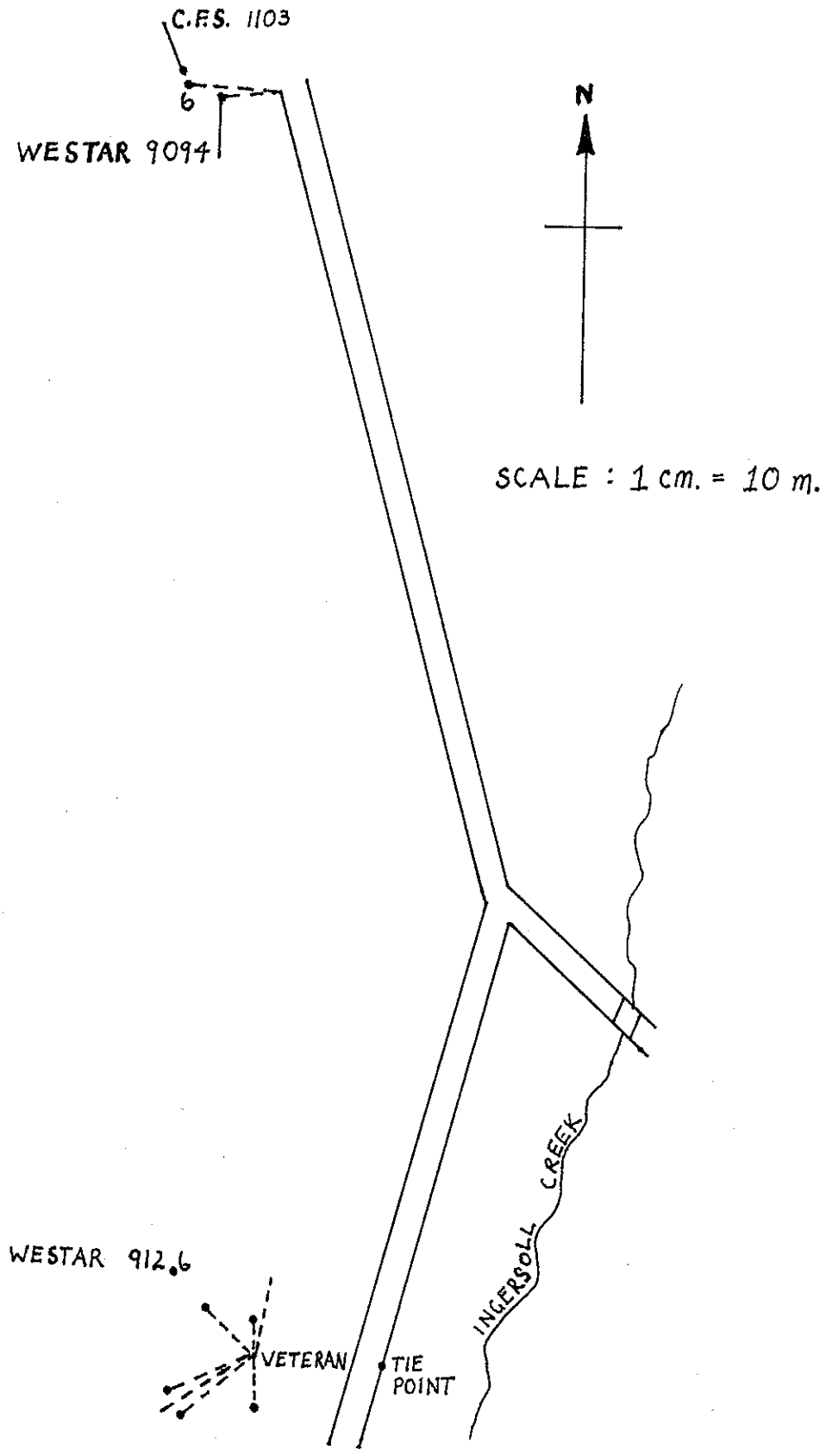

FIGURE 2 ACCESS TO DEMONSTRATION AREA

INGERSOLL CREEK WHITE PINE DEMONSTRATION AREA
(LAT. 118°05.2'N LONG. 50°01'W)

From the West side of Arrow Park Ferry (12km South of Nakusp on Hwy. 6) go 7.7km on Lower Mosquito Road; then left on Stevens Road for 11.5km; then left on Whatshan Road for 9km to junction of Branch 7 and Whatshan Road. This is the NW corner of proposed demonstration area.