TITLE  Efficacy of Manual Treatment Timing on Sitka Alder in Immature Engelmann Spruce

Report prepared by:  

(Full Name)  

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Report & Distribution approved by:  

(RBM McNaughton)  

R. B. McNaughton  

(a) Wide Distribution  

(b) Limited  

(i) Internal - Branch only  

(ii) External - Designated  

(iii) Ministry only

COPY TO

Kootenay Lake District  

Nelson Region  

Silviculture Branch

Approved:  

Manager - (RBM McNaughton)  

D. L. Oswald

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Efficacy of Manual Treatment Timing on Sitka Alder in Immature Engelmann Spruce

WORKING PLAN (Modified)

I. LOCATION

Gold Hill Face, Lardeau River, 90 km N of Kaslo, BCG Opening 82K.035-33, UTM 11:4944:55805

II. OBJECTIVES

1. To determine optimum manual treatment timing for controlling Sitka alder, cottonwoods and willow.

2. To monitor the effect of manual treatment timing on immature Engelmann spruce.

III. LAYOUT

Four manual treatment units will be established along with one control treatment. The treatments will be applied between May 1986 and September 1986 at roughly one month intervals. Treatment details are shown in the following table:

<table>
<thead>
<tr>
<th>Treatment Date</th>
<th>Unit</th>
<th>Size</th>
<th>ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late May</td>
<td>A</td>
<td>irregular</td>
<td>0.19</td>
</tr>
<tr>
<td>Early August</td>
<td>B</td>
<td>50m x 50m</td>
<td>0.25</td>
</tr>
<tr>
<td>Control</td>
<td>C</td>
<td>50m x 50m</td>
<td>0.25</td>
</tr>
<tr>
<td>Late June</td>
<td>D</td>
<td>50m x 50m</td>
<td>0.25</td>
</tr>
<tr>
<td>Early September</td>
<td>E</td>
<td>50m x 50m</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Total: 1.19

IV. PHOTO POINTS

Photo points will be established in the NW and SE corner of each treatment unit and photos will be taken periodically.

V. TARGET SPECIES

1. alder (Alnus sinuata) 2-2.5m; 80%
2. cottonwoods (Populus trichocarpa) 4-6m; 10-15%
3. willow (Salix sp.) 2-3.0m; 5-10%

Comments: Approximately 10,000 stems per hectare of brush.
VI. CROP TREES

Engelmann spruce (Picea engelmanni)

VII. MONITORING

The treatments will be monitored according to Ministry of Forests SX-0 trial guidelines, using twenty circular 10m² plots per treatment unit. Assessments will be conducted after 1, 2, and 5 growing seasons.

VIII. ESTABLISHMENT

The treatments will be conducted between May, 1986 and September 1986 at approximately 30-35 day intervals. All target species to be removed using chainsaw or brushsaw.

IX. REPORTING

An interim report will be completed by January, 1987, with the final report due January, 1991. Data collating and report writing will be undertaken by the Regional Research Officer.

X. SITE PARAMETERS

AREA: ± 1.0 ha
SOILS: LFH: disturbed
      Texture: Sil SL
      C.F. %: 15-20
      Depth to Impermeable: 3m
ASPECT: East
SLOPE: 20 - 40%
SLOPE POSITION: Mid - Upper
ELEVATION: 945 - 1006 m
B.G.C. ZONE: ICHA2
B.G.C. ASSOCIATION: 1: Paxistima-Orthilla
EDATOPE: 3-4/C

REGENERATION: Unsuccessful Douglas-fir plantation with ingrowth of hemlock, cedar, white pine, and Engelmann spruce. Approximately 1,000 well-spaced stems per hectare (total density: 3,500 sph).

OVERSTORY RESIDUALS/SNAGS: Less than 10 per ha: 10-15 m high
SLASH: ± 40% (moderate)
MACHINE TRAFFICABILITY: Poor
HYDROLOGY: Well drained. Check for location of active drainage channels after spring runoff.

WILDLIFE/FISHERIES/RECREATION VALUES: There are no fisheries or wildlife values directly affected by this trial. Recreation activities in the immediate area are hunting, 4-wheel driving and snowmobiling.

SETTLEMENTS: Meadow Creek


:0071S
GOLD HILL
BRUSHING TRIAL

SCALE 1:1600

TREATMENT:

Block "A"  MAY 23RD, 1986
Block "B"  AUGUST 12, 1986
Block "C"  CONTROL
Block "D"  JUNE 25, 1986
Block "E"  SEPT. 8th, 1986

COMPLETE REMOVAL OF SALIX, POPULUS, ALNUS SP.
WITH BRUSH SAWS.

#1, #2 PHOTO POINTS
Efficacy of Manual Treatment Timing on Sitka Alder in Immature Engelmann Spruce

Officer i/c: L. Hanlon
Location: Gold Hill
Region/District: Nelson/Kootenay Lake

Objectives:
1. To determine optimum manual treatment timing for controlling Sitka alder, cottonwood and willow.
2. To monitor the effect of manual treatment timing on immature Engelmann spruce.

Progress: Treatments done 1986.
First Assessment Fall 1986.
No spruce response detectible after first growing season. Brush regrowth currently reflects the length of time after cutting.

Next Scheduled Assessment: Fall 1987
Report Distribution: Silviculture Branch
Nelson Region
Kootenay Lake District

Incomplete.
Efficacy of Manual Treatment Timing on Sitka Alder in Immature Engelmann Spruce

SX
Interim Report April, 1987

I. LOCATION

Gold Hill Face, Lardeau River, 90 km N of Kaslo BCG Opening 82K.035-33
UTM 11:4944:55805

II. OBJECTIVES

1. To determine optimum manual treatment timing for controlling Sitka alder, cottonwoods and willow.

2. To monitor the effect of manual treatment timing on immature Engelmann spruce.

III. TRIAL DESIGN AND ESTABLISHMENT

Four manual brushing treatments were carried out between May and September 1986. A control unit was also established. Competing vegetation (Sitka alder, cottonwood and willow) was removed using chainsaws or brushesaws as close to ground level as possible. Details of the treatments are as follows:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Treatment Date</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>May 23, 1986</td>
<td>.19</td>
</tr>
<tr>
<td>B</td>
<td>August 12, 1986</td>
<td>.25</td>
</tr>
<tr>
<td>C</td>
<td>Control</td>
<td>.25</td>
</tr>
<tr>
<td>D</td>
<td>June 25, 1986</td>
<td>.25</td>
</tr>
<tr>
<td>E</td>
<td>September 8, 1986</td>
<td>.25</td>
</tr>
</tbody>
</table>

Total 1.19

IV. PHOTO POINTS

Photo points were established in the NW and SE corners of each unit using 1/2" angle iron posts about 1 metre in height. Photos were taken prior to treatment and post treatment photos will be established in 1987.
V. MONITORING

Pre-treatment plots (20 per unit) were established using SX "O" guidelines in May of 1986. These 10m² assessment plots were systematically laid out to include one spruce crop tree and the two predetermined target species (Sitka alder and willow). These plots were remeasured in late September-October 1986 after all treatments were completed.

Further assessments will be done in September 1987 and 1990.

VI. RESULTS

Assessed one growing season after treatment. (Refer to the following tables):

**TABLE 1**

Sitka Alder Response to Treatments (October, 1986)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Ht.(cm) S'86</th>
<th>Ht.(cm) F'86</th>
<th>% cover S'86</th>
<th>% cover F'86</th>
<th>% cover reductn</th>
<th>sprouts after trtmnt</th>
<th>stems with sprouts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>273.3b</td>
<td>293.2a</td>
<td>31.1a</td>
<td>33.7a</td>
<td>+2.6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>May 23, 1986</td>
<td>300.3ab</td>
<td>28.2b</td>
<td>31.8a</td>
<td>9.2b</td>
<td>21.6</td>
<td>10.4a</td>
<td>2.4a</td>
</tr>
<tr>
<td>June 25, 1986</td>
<td>303.0ab</td>
<td>8.6b</td>
<td>41.0a</td>
<td>5.8bc</td>
<td>35.2</td>
<td>15.6a</td>
<td>2.1a</td>
</tr>
<tr>
<td>Aug. 12, 1986</td>
<td>322.6a</td>
<td>10.5b</td>
<td>46.5a</td>
<td>0.4c</td>
<td>46.1</td>
<td>0.8b</td>
<td>1.5a</td>
</tr>
<tr>
<td>Sep. 8, 1986</td>
<td>304.2b</td>
<td>0.0b</td>
<td>42.6a</td>
<td>0.0c</td>
<td>42.6</td>
<td>0.0b</td>
<td>0.0b</td>
</tr>
</tbody>
</table>

**TABLE 2**

Willow Response to Treatments (October, 1986)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Ht.(cm) S'86</th>
<th>Ht.(cm) F'86</th>
<th>% cover S'86</th>
<th>% cover F'86</th>
<th>% cover reductn</th>
<th>sprouts after trtmnt</th>
<th>stems with sprouts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>337.8a</td>
<td>362.5a</td>
<td>12.8ab</td>
<td>12.8a</td>
<td>0.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>May 23, 1986</td>
<td>329.3a</td>
<td>77.5b</td>
<td>11.8ab</td>
<td>14.1a</td>
<td>+2.3</td>
<td>14.0a</td>
<td>2.2a</td>
</tr>
<tr>
<td>June 25, 1986</td>
<td>332.1a</td>
<td>45.4b</td>
<td>9.1b</td>
<td>6.7b</td>
<td>2.4</td>
<td>8.1b</td>
<td>1.3a</td>
</tr>
<tr>
<td>Aug. 12, 1986</td>
<td>362.5a</td>
<td>1.0c</td>
<td>14.4ab</td>
<td>0.3c</td>
<td>14.1</td>
<td>1.2c</td>
<td>1.7a</td>
</tr>
<tr>
<td>Sep. 8, 1986</td>
<td>383.4a</td>
<td>0.0c</td>
<td>17.2a</td>
<td>0.3c</td>
<td>16.9</td>
<td>0.0c</td>
<td>0.0a</td>
</tr>
</tbody>
</table>
TABLE 3

Engelmann Spruce Response to Treatments (October, 1986)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Caliper (mm)</th>
<th>Ht. (cm)</th>
<th>Leader (cm)</th>
<th>Brush Encroachment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S'86</td>
<td>S'86</td>
<td>Pre-Treat'86</td>
<td>S'86 (0-100)</td>
</tr>
<tr>
<td>Control</td>
<td>35.4a</td>
<td>168.25a</td>
<td>19.95a</td>
<td>40.0 b</td>
</tr>
<tr>
<td>May 23, 1986</td>
<td>36.9a</td>
<td>188.65a</td>
<td>21.95a</td>
<td>55.28b</td>
</tr>
<tr>
<td>June 25, 1986</td>
<td>32.8a</td>
<td>155.30a</td>
<td>18.90a</td>
<td>52.78b</td>
</tr>
<tr>
<td>Aug. 12, 1986</td>
<td>40.5a</td>
<td>194.80a</td>
<td>22.25a</td>
<td>55.75b</td>
</tr>
<tr>
<td>Sep. 8, 1986</td>
<td>38.7a</td>
<td>181.65a</td>
<td>20.20a</td>
<td>76.67a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Caliper (mm)</th>
<th>Ht. (cm)</th>
<th>Leader (cm)</th>
<th>Brush Encroachment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F'86</td>
<td>F'86</td>
<td>Post-Treat'86</td>
<td>F'86 (0-100)</td>
</tr>
<tr>
<td>Control</td>
<td>39.3a</td>
<td>182.00a</td>
<td>13.75a</td>
<td>47.37a</td>
</tr>
<tr>
<td>May 23, 1986</td>
<td>44.3a</td>
<td>207.75a</td>
<td>19.10a</td>
<td>29.21b</td>
</tr>
<tr>
<td>June 25, 1986</td>
<td>38.7a</td>
<td>166.75a</td>
<td>11.45a</td>
<td>0.00c</td>
</tr>
<tr>
<td>Aug. 12, 1986</td>
<td>44.7a</td>
<td>210.75a</td>
<td>15.95a</td>
<td>1.25c</td>
</tr>
<tr>
<td>Sep. 8, 1986</td>
<td>44.2a</td>
<td>198.40a</td>
<td>16.75a</td>
<td>2.50c</td>
</tr>
</tbody>
</table>

VII. DISCUSSION

1. Target Species Response

   a) Sitka Alder (Table 1)

   Sitka Alder is significantly reduced in height and percent
cover for all treatment dates when compared to the control.
When comparing treatment dates there is no significant
difference in height reduction however the change in percent
cover is greater for the two later cutting dates when compared
to the earliest cutting date. Further assessments will
determine if this trend will continue to be significant.
b) Willow (Table 2)

As with Alder, all treatments dramatically reduced the height of the willow compared to the control. The two earliest cutting dates indicate significantly different greater height regrowth compared to the later two treatments. (This may be a function of the little time that elapsed between the treatment and measurement, especially with the September treatment.) The percent cover has also been greatly reduced for the third and fourth brushing dates when compared to the second brushing, while coverage has increased above pretreatment levels for the first brushing date. As there is significantly more willow sprouts occurring in this treatment this accounts for the increase.

2. Crop Tree Response

Engelmann Spruce (Table 3)

As expected there are no significant differences in tree growth or tree condition as a result of the treatments. Brush encroachment is significantly reduced in all treated blocks when compared to the control. In the control brush encroachment has increased slightly above the pretreatment levels.

VIII. Conclusion

A manual brushing treatment initiated in late May through to late June has effectively reduced the percent cover of Sitka Alder for one growing season when compared to the response of willow. Height reduction are also comparatively greater for the Sitka Alder. Significant differences in crop tree response are not evident after one growing season.

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