

FILE REPORT NOR-Y-50

G.H. Dixon (1972)

OUTPLANTING TRIALS OF THE BRITISH COLUMBIA FOREST SERVICE/CANADIAN
FORESTRY SERVICE PLUGS AND THE RESEARCH COUNCIL OF ALBERTA SAUSAGE
CONTAINERS, 1971-1973.

Northern Forest Research Centre
Environment Canada
Edmonton

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OUTPLANTING TRIALS OF THE BRITISH COLUMBIA FOREST
SERVICE/CANADIAN FORESTRY SERVICE PLUGS AND THE RESEARCH COUNCIL
OF ALBERTA SAUSAGE CONTAINERS, 1971-1973.
(PROGRESS REPORT FOR PROJECT NOR-111)

by

G.H. Dixon*

INTRODUCTION

The B.C./C.F.S. Styroblock and R.C.A. Sausage outplanting trials were initiated in 1971 to provide survival, growth and root development data on these promising reforestation methods.

The trials, replicated over six representative sites in Alberta and one site each in the Yukon and Northwest Territories are intended to test and compare this plug form against conventional bare root plants from standard nursery production.

The resulting field performance data is essential feedback to the reforestation research program in this region.

The trials began in 1971 with the rearing of white spruce (Picea glauca (Moench) Voss var. albertiana (S. Brown) Sarg.), engelmann spruce (Picea engelmannii Parry), lodgepole pine (Pinus contorta Dougl. var. latifolia Engelm.) and jack pine (Pinus banksiana Lamb.) in styroblocks and sausages. Subsequent to rearing and cold framing, planting was carried out in six forest districts representing the Mixedwood, Foothills and Sub-Alpine Forests of Alberta. These trials will be carried out over a three year period; 1971, 1972 and 1973.

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METHODS AND PROCEDURES

Seedlings reared at the Northern Forest Research Centre greenhouses are being planted in pre-selected scarified, logged over sites in Alberta. Rearing and planting is being carried out over three years and commenced in 1971. In 1972 the styroblock trials were extended to the Yukon and Northwest Territories representing the Upper Liard and Upper Mackenzie Sections of the Boreal Forest.

In each of the pre-selected sites a minimum of 2000 BC-CFS and 2000 RCA plugs are being planted for each species. Depending on the residual species present some sites will have two species planted, therefore the totals will double. On each site 200 conventional 3-0 Oliver nursery production stock of the same species will be planted as a control. (See Appendix 1 for numbers and species of seedlings raised for each site).

Planting is being carried out on scarified strips. Half of the seedlings planted on each strip are being pinned and numbered. Selection of seedlings for pinning is done on a random basis. Periodic root development measurements will be carried out on the seedlings that are not marked.

The numbering of seedlings is done using vinyl loop labels of different colors for each species used. (See Appendix 1).

Survival, growth and root development measurements will be done at 1, 3 and 5 year intervals on each of the three years of planting.

Rearing Trays

BC-CFS Styroblock.

The BC-CFS styroblock was developed in 1970 (Kinghorn 1970) as a new concept for rearing seedlings which eliminates the root-restricting container at the time of planting. The tray is formed by injection moulding of expandable

poly-styrene. There are 192 tapered cavities per tray. Each cavity being $4\frac{1}{2}$ inches long with a top diameter of one inch. The cavity wall tapers in at .07 inches per inch of length giving a bottom opening of .375" and a rooting volume of 2.5 cubic inches. (See Figures 1 and 2). The cavities are open at the bottom to promote air pruning of roots.

R.C.A. Sausage.

The peat sausage was developed by the Research Council of Alberta. It is formed by forcing a simifluid peat paste (80% moisture) through a die into a length of tubular plastic film one inch in diameter. The tubular length of media filled plastic is then cut to 3 inch lengths and placed in a wooden walled tray with a screened bottom. The screened bottom is to promote air pruning of roots. (See Figures 3 and 4). A small depression is made at the surface of each sausage with compressed air, for use as a pocket in which the seeds are placed. This is done so no disturbance of seed occurs when plastic is placed over the tray during the germination period.

Each tray contains 98 sausages. The volume of each sausage is 2.4 cu. inches and the bulk density is about .15 dry weight (g)/wet volume (cc). Bulk density and moisture content of the media is controlled and various ranges of these are possible.

Loading Styroblocks

The rooting media used in the styroblock was commercially available, baled peat moss. The peat is first screened to remove wood chips, placed in burlap sacks and sterilized by steam for $1\frac{1}{2}$ hours at 185°F . The peat is then pre-wet and loaded into the styroblocks using a combination of a vibrating

table (See Figures 5 and 6) and fingers. The peat level in the cavities is kept to within $\frac{1}{4}$ to $\frac{1}{2}$ inch of the surface to prevent seed and germinant disturbance when plastic was placed over the trays during the germination period.

Seed Preparation and Seeding

High germination seed lots of engelmann and white spruce, lodgepole and jack pine were withdrawn from storage at the Oliver Tree Nursery in 4 oz. seed lots. (See Appendix 2 for seed lots by site).

Seeds were surface sterilized by soaking in 3% hydrogen peroxide for 30 minutes, then surface dried and re-bagged and stored in refrigeration until seeding.

Seeding was carried out by hand at 3 seeds per cavity. Washed number 2 granite grit was sprinkled lightly, by hand, over the seed to help germinants take root and maintain surface moisture.

Trays were then misted, placed in the greenhouse, and covered with transparent polyethylene to aid germination. Once germination commenced the plastic was removed, usually eight days after seeding. At this time the seedlings were considered to be of age zero.

Rearing

The rearing schedule is given, in detail, in Appendix 3 for 1971 and 1972 planting stock.

Thinning and culling to one germinant per container was done from age 1 to 2 weeks. Fertilizing commenced at age 2 weeks using Hockings nutrient solution described in Information Report NOR-X-1 (Hocking, 1971). Seedlings were watered several hours before fertilizing to promote even percolation of nutrients.

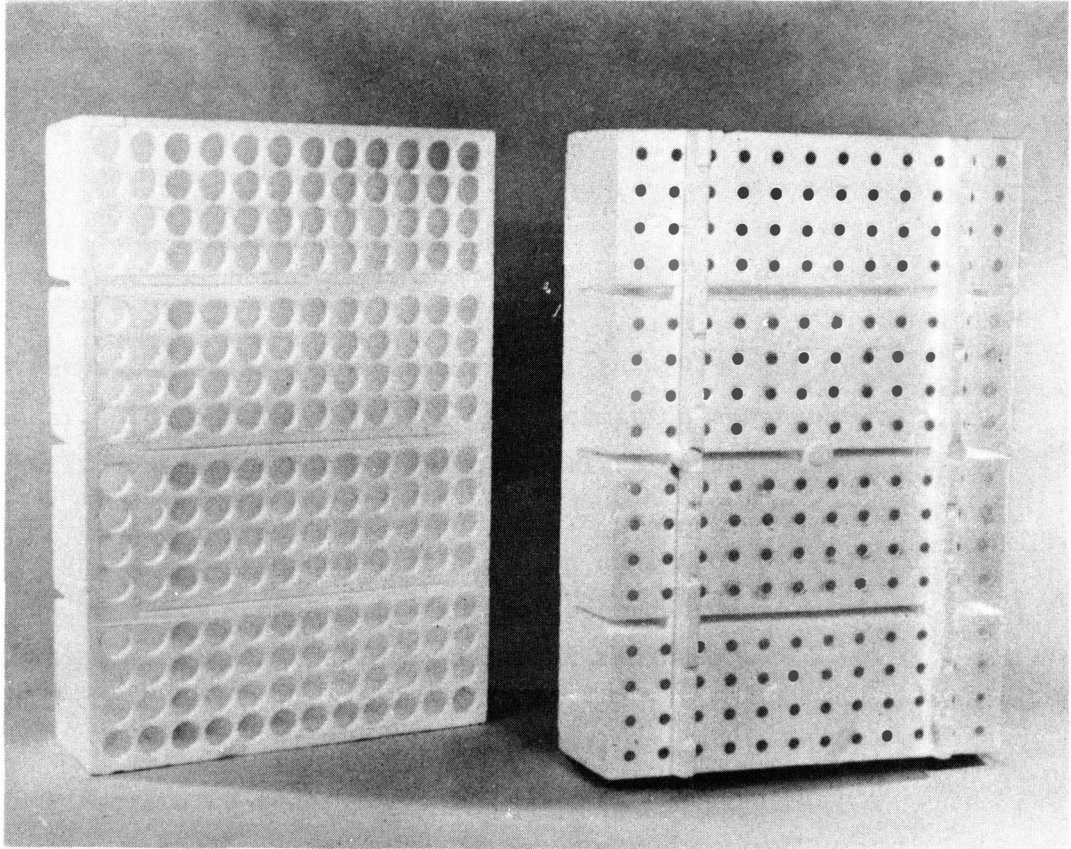


Figure 1. Top and bottom views of Styroblock tray.

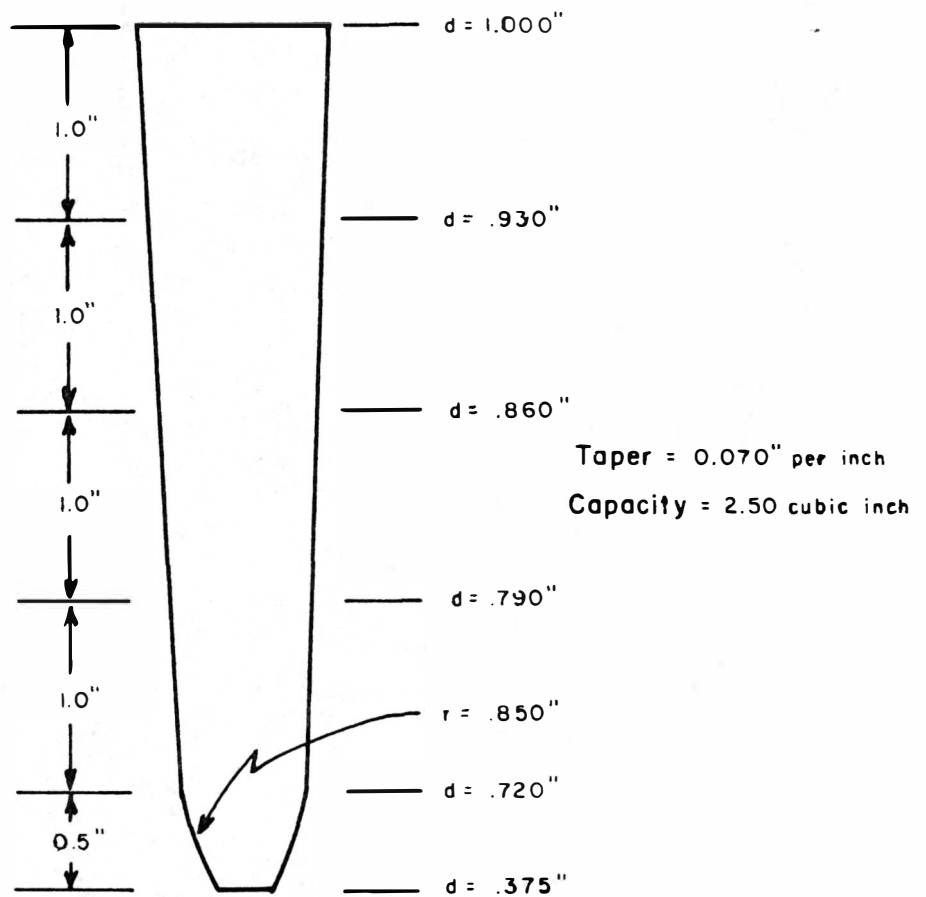


Figure 2. British Columbia/Canadian Forestry Service Styroblock plug.

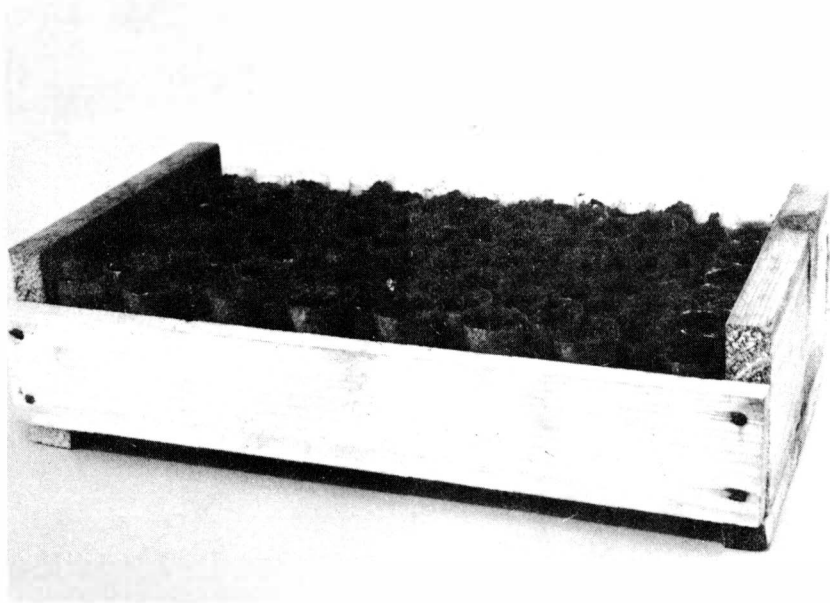


Figure 3. Top view of Research Council sausages and tray.

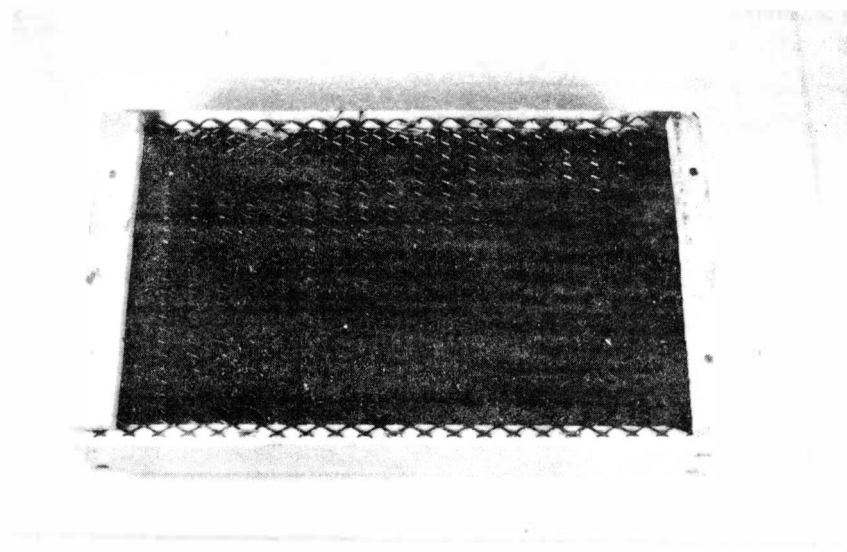


Figure 4. Bottom view of Research Council sausages and tray.

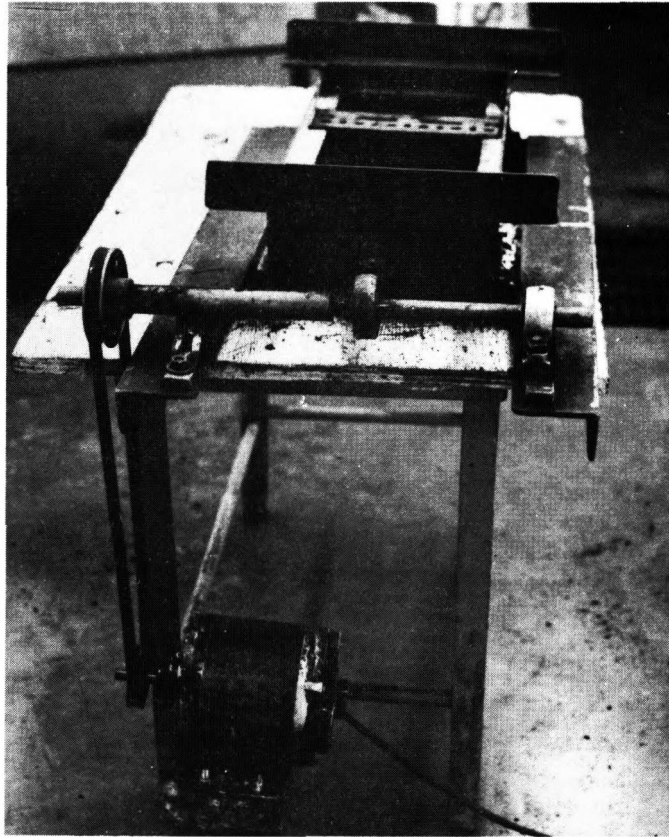


Figure 5. Vibrating table.

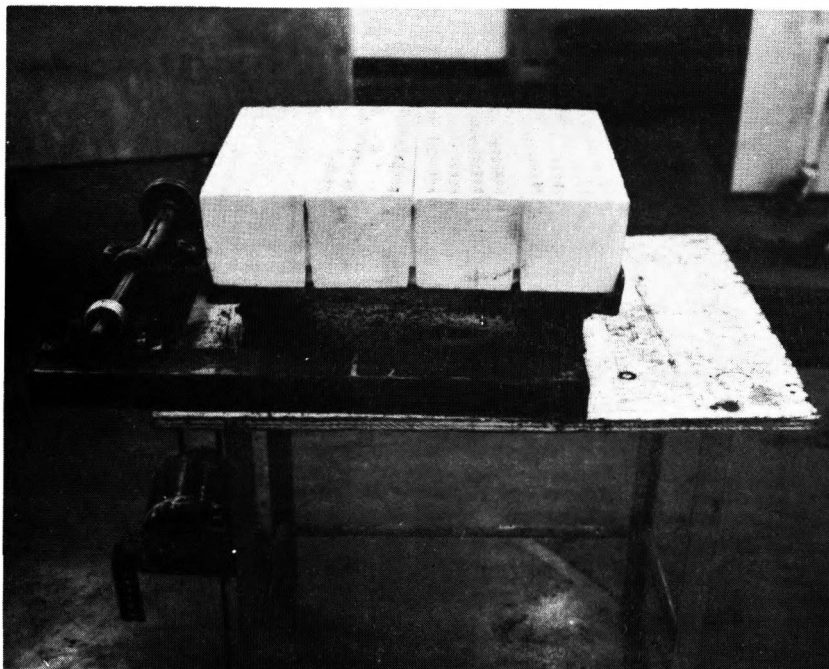


Figure 6. Vibrating table with Styroblock ready for loading.

After fertilizing, seedlings were misted to remove chemical traces from needles, preventing fertilizer burning. Additional watering was needed during the week as the seedling grew.

Greenhouse temperatures were kept at 70°F during the day and 60°F at night. Additional fluorescent lighting was maintained over the seedlings from 6 am till 12 midnight to prolong the photo period.

At age 10 weeks the trays were removed to cold frames and shaded with snow fence to prevent sun scald. As the seedlings hardened off, shading was gradually reduced until age 14 weeks. Subsequently no shading was provided unless extremes of weather occurred.

Sampling

As each group of seedling left the cold frames for field planting a random sample of twenty seedlings were taken from each seed lot for root-to-shoot destructive analysis. Seedlings were washed out, cut at the root collar and oven dried. This is expressed in Table 1 as a shoot-to-root dry weight ratio for the 1971 planting stock, including conventional seedlings, and Table 2 for the 1972 planting stock.

Table 1. Shoot-to-root ratios 1971 Planting Stock (before planting).

District	Conventional 3-0		R.C.A. Sausage		Styroblock	
	Spruce	Pine	Spruce	Pine	Spruce	Pine
Whitecourt	5.36	4.55	3.62	3.56	1.98	0.94
Lac La Biche	5.07		2.95		1.69	
Bow		4.56		2.53		0.98
Grande Prairie	4.37		3.30	2.92	1.72	1.04
Crowsnest	2.94		2.01	3.51	1.38	1.13
Footner Lake	4.80		3.55		1.51	
Average - All Sites Combined	4.44	4.58	2.92	3.47	1.61	1.03

Table 2. Shoot-to-root ratios 1972 Planting Stock (before planting).

District	Conventional 3-0		R.C.A. Sausage		Styroblock	
	Spruce	Pine	Spruce	Pine	Spruce	Pine
Whitecourt	3.9	3.7	2.4	1.4	1.9	1.2
Lac La Biche	4.3		1.9		2.3	
Bow		5.2		1.8		1.2
Grande Prairie	4.1	4.2	2.6	1.6	2.6	1.3
Crowsnest	2.9	4.2	1.7	1.8	1.9	1.2
Footner Lake			2.4		2.4	
Yukon					1.4	0.8
Northwest Territories						1.1
Average - All Sites Combined	3.8	4.3	2.2	1.7	2.1	1.1

Planting and Planting Sites

Planting is being carried out on cut-over areas that have been scarified at least one year prior to planting. Scarification is by dozer blade in long strips, baring the mineral soil.

Dibbles conforming to the styroblock cavity dimensions were constructed and used for the 1971 and 1972 planting. Coring dibbles obtained from the Alberta Forest Service were used for planting sausages. The polyethylene sausage skin was removed before planting.

Appendix 4 maps and describes the planting sites used for the 1971 and 1972 plantings. These sites will be used for the third planting, if possible, in 1973.

REFERENCES

- Hocking, D. 1971. A nutrient solution for Alberta white spruce and lodgepole pine. Can. Dep. Fish. & Forest., Res. Lab., Edmonton, Alta. Intern. Rep.
- Kinghorn, J.M. 1970. The status of container planting in western Canada. Forest. Chron. 46(6):466-469.

APPENDIX 1

Numbers and Species of Seedlings to be Reared and Planted, Plus Label Color Codes For Each Species, by Site - 1971 Plantings.

Crowsnest

Total number of seedlings reared -

Lodgepole Pine

2000 BC-CFS plugs

2000 RCA sausages

200 3-0 conventional

Engelmann Spruce

2000 BC-CFS plugs

2000 RCA sausages

200 3-0 conventional

Vinyl loop label color codes

Lodgepole Pine

BC-CFS plugs - orange

RCA sausage - blue

3-0 conventional - yellow

Engelmann Spruce

BC-CFS plugs - pink

RCA sausage - red

3-0 conventional - white

Whitecourt

Total number of seedlings reared plus color codes -

Lodgepole Pine

2000 BC-CFS plugs - orange

2000 RCA sausages - blue

200 3-0 conventional - yellow

White Spruce

2000 BC-CFS plugs - pink

2000 RCA sausages - red

200 3-0 conventional - white

Grande Prairie

Total number of seedlings reared plus color codes -

Lodgepole Pine

2000 BC-CFS plugs - orange

2000 RCA sausages - blue

200 3-0 conventional - yellow

White Spruce

2000 BC-CFS plugs - pink

2000 RCA sausages - red

200 3-0 conventional - white

Footner Lake

Total number of seedlings reared plus color codes -

White Spruce

2000 BC-CFS plugs - pink

2000 sausage - red

200 conventional - white

Lac La Biche - (Calling Lake)

Total number of seedlings reared plus color codes -

White Spruce

2000 BC-CFS plugs - pink

2000 sausage - red

200 conventional - white

Bow

Total number of seedlings reared plus color codes -

Lodgepole Pine

2000 BC-CFS plugs - orange

2000 sausage - blue

200 conventional - yellow.

Numbers and Species of Seedlings to be Reared and Planted Plus Label Color Codes For Each Species, by Site; 1972 Plantings.

Crowsnest

Total number of seedlings reared -

Lodgepole Pine

2000 BC-CFS plugs

2000 RCA sausages

200 3-0 conventional

Engelmann Spruce

2000 BC-CFS plugs

2000 RCA sausages

200 3-0 conventional

Vinyl loop label color codes -

Lodgepole Pine

BC-CFS plugs - orange

RCA sausage - blue

3-0 conventional - yellow

Engelmann Spruce

BC-CFS plugs - pink

RCA sausage - red

3-0 conventional - white

Whitecourt

Total number of seedlings reared plus color code -

Lodgepole Pine

2000 BC-CFS plugs - orange

2000 RCA sausage - blue

200 3-0 conventional - yellow

White Spruce

2000 BC-CFS plugs - pink

2000 RCA sausage - red

200 3-0 conventional - white

Grande Prairie

Total number of seedlings reared plus color code -

Lodgepole Pine

2000 BC-CFS plugs - orange
2000 RCA sausage - blue
200 3-0 conventional - yellow

White Spruce

2000 BC-CFS plugs - pink
2000 RCA sausage - red
200 3-0 conventional - white

Footner Lake

Total number of seedlings reared, plus color codes -

White Spruce

2000 BC-CFS plugs - pink
2000 RCA sausage - red
200 3-0 conventional - white

Lac La Biche (Calling Lake)

Total number of seedlings reared, plus color codes -

White Spruce

2000 BC-CFS plugs - pink
2000 RCA sausage - red
200 3-0 conventional - white

Bow

Total number of seedlings reared, plus color codes -

Lodgepole Pine

2000 BC-CFS plugs - orange
2000 RCA sausages - blue
200 3-0 conventional - yellow

Yukon (Watson Lake)

Total number of seedlings reared, plus color codes -

Lodgepole Pine

2000 BC-CFS plugs - orange

Black Spruce

2000 BC-CFS plugs - pink

Northwest Territories

Total number of seedlings reared, plus color code -

Jack Pine

2000 BC-CFS plugs - orange.

APPENDIX 2

Seed Lots, By Site, Withdrawn from Alberta Tree Nursery for 1971 Plantings.

<u>Site</u>	<u>Species</u>	<u>Lot No.</u>	<u>Collected</u>	<u>Germination Test</u>
Crowsnest	1P	DC 2-2	1969	83.3%
	eS	DC 1-1	1968	93%
Whitecourt	1P	DW 32	1968	79%
	wS	DW 4-13	1968	87.7%
Grande Prairie	1P	DG 3-4	1968	88%
	wS	DG 2-2	1968	87%
Footner Lake	wS	DF 1-2	1968	93.3%
Lac La Biche	wS	DL 2-1	1969	93%
Bow	1P	DB 5-1	1969	82.6%

Seed Lots, By Site, Withdrawn from Alberta Tree Nursery for 1972 Plantings.

<u>Site</u>	<u>Species</u>	<u>Lot No.</u>	<u>Collected</u>	<u>Germination Test</u>
Crowsnest	1P	DC 2-2	1969	89%
	eS	DC 277	1964	67%
Whitecourt	1P	DW 32	1968	89%
	wS	DW 2-1	1970	81%
Grande Prairie	1P	DG 3-7	1970	88%
	wS	DG 2-2	1968	75%
Footner Lake	wS	DF 1-2	1968	77%
Lac La Biche	wS	DL 2-1	1969	88%
Bow	1P	DB 5-1	1969	83%
Yukon	1P	CFS-2*	1971	76%
	bS	CFS-1*	1971	67%
Northwest Territories	jP	DA 3-1	1970	86%

*Cones collected by Yukon Forest Service.

APPENDIX 3

Rearing Schedule; 1971 Plantings

Date	Seedling Age (weeks)	Remarks
March 15 - 18		Seeding
March 23 - 25		Polyethylene removed
March 26	0	
March 30		Watered
April 2 - 7	1	Thinning
April 9	2	Water and fertilizer
April 16	3	Water and fertilizer
April 23	4	Water and fertilizer
April 30	5	Water and fertilizer
May 7	6	Water and fertilizer
May 14	7	Water and fertilizer
May 21	8	Water and fertilizer
May 28	9	Water and fertilizer
June 4	10	Water and fertilizer
June 7	10	Move into cold frames-water
June 11	11	Water and fertilizer
June 18	12	Water and fertilizer
June 25	13	Water and fertilizer
July 2	14	Last fertilizer application
July 9	15	Watering as required
July 16	16	Watering as required
July 20	16	Planting commenced

* From age 2 weeks till planting commenced, additional watering of seedlings was done as required.

Rearing Schedule; 1972 Plantings

Date	Seedling Age (weeks)	Remarks
February 7 - 17		Seeding
February 15 - 26		Polyethylene removed
February 26	0	
February 29		Watered
February 29 - March 9	2	Thinning
March 10	2	Water and fertilizer
March 17	3	Water and fertilizer
March 24	4	Water and fertilizer
March 31	5	Water and fertilizer
April 7	6	Water and fertilizer
April 14	7	Water and fertilizer
April 21	8	Water and fertilizer
April 28	9	Water and fertilizer
May 5	10	Water and fertilizer
May 12	11	Water and fertilizer
May 15	11½	Move into cold frames-water
May 19	12	Water and fertilizer

Rearing Schedule; 1972 Plantings continued.

May 26	13	Water and fertilizer
June 2	14	Last fertilizer application
June 9	15	Watering as required
June 13	15½	Planting commenced

* From age 2 weeks till planting commenced, additional watering of seedlings was done as required.

APPENDIX 4

Footner Lake Forest

1971 Plantings

Site location - Milito timber berth, 28 miles west of High Level on Highway 58.

Rainbow road F 15 - L 10 Twp. 110 Rng. 24 Sec. 22 West 5 Mer.

Species - Conventional 3-0 white spruce - white labels

Styroblock white spruce - pink labels

R.C.A. sausage white spruce - red labels

Planting conditions

Seedlings planted August 11 - 12 on scarified strips. Weather cool and cloudy with light rain. Soil was hard and dry during planting.

Footner Lake Forest

1972 Plantings

Site location - Milito timber berth, 28 miles west of High Level on Highway

58. Rainbow road F 15 - L 10. Adjacent to 1971 plantings. Twp. 110

Rng. 24 Sec. 22 West 5 Mer.

Species - Styroblock white spruce - pink labels

RCA sausage white spruce - red labels

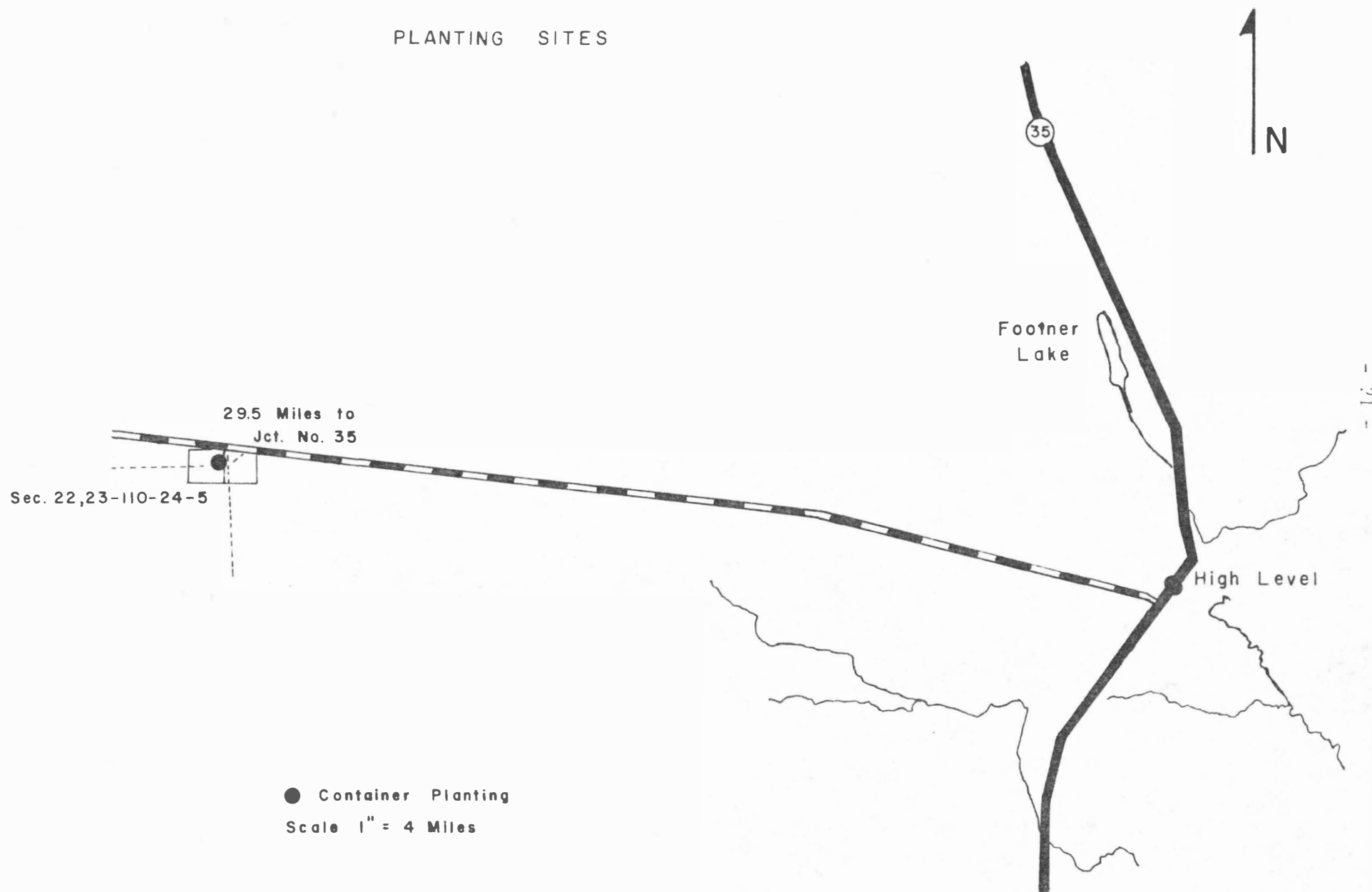
Conventional 3-0 white spruce - non available for planting

Planting conditions - Seedlings planted June 22 - 23, 1972 on scarified 1

acre site. Weather was very hot but soil moisture was adequate for planting.

FOOTNER LAKE FOREST

PLANTING SITES

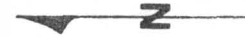


FOOTNER LAKE FOREST

84	1
85	186
284	187
285	385
485	386
486	588
689	589
690	790
890	791
891	991
1000 (1X1 foot)	992
100	1
101	200
300	201
301	400
500	401
501	600
700	601
701	800
900	801
901	1000
(1X1 foot)	

White Spruce

Planted June 22-23, 1972



White Spruce Planted August 11-12, 1971	
876-1000	1000-876
751-875	875-751
501-625	625-501
376-500	500-376
251-375	375-251
126-250	250-126
1-125 (3X3 feet)	120-1
626-750	750-626
251-375	375-251
1-125 (3X3 feet)	120-1
	Conventional

Whitecourt Forest

1971 Plantings

Site location - 11.5 miles west from Nojack Hotel on Highway 16, then south to Carrot Tower. Site is 2 miles south of the tower where road, seismic line and old landing meet Twp. 51 Rng. 13 Sec. 23 West 5 Mer.

Species - conventional 3-0 white spruce - white labels

conventional 3-0 lodgepole pine - yellow labels

styroblock white spruce - pink labels

styroblock lodgepole pine - orange labels

RCA sausage white spruce - red labels

RCA sausage lodgepole pine - blue labels

Planting conditions - seedlings planted July 20-23 on scarified strips. Site is a mature aspen stand with spruce scattered throughout. The soil was very compact but soil moisture was fair, low spots had standing water. Strips were clear of vegetation. Seedlings were planted three across on the strips with every second seedling pinned and labeled.

Whitecourt Forest

1972 Plantings

Site location - 11.5 miles west from Nojack Hotel on Highway 16, then south on the Carrot Tower road 12.5 to Carrot Tower, then north 1.5 miles.

Site is on east side of road. Twp. 52 Rng. 13 Sec. 4 West 5 Mer.

Species - conventional 3-0 white spruce - white labels

conventional 3-0 lodgepole pine - yellow labels

Styroblock white spruce - pink labels

Styroblock lodgepole pine - orange labels

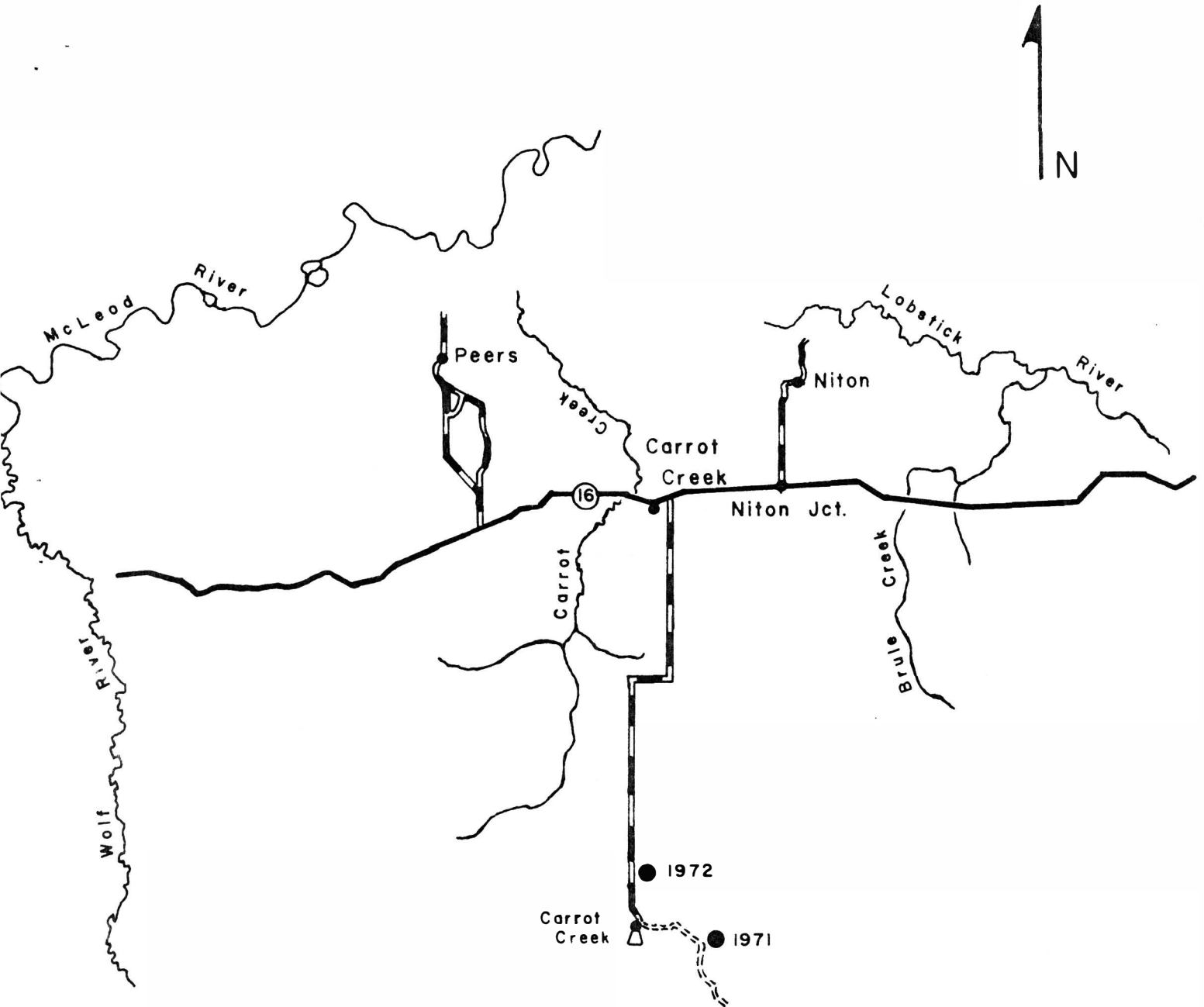
RCA sausage white spruce - red labels

RCA sausage lodgepole pine - blue labels

Planting conditions - Seedlings planted July 11-14 on scarified strips. Site is a mature aspen stand with matured spruce scattered throughout. Vegetation on scarified strips was light and soil moisture at time of planting, was good. Two rows of seedlings were planted per scarified strip, every second seedling was pinned and tagged.

WHITCOURT FOREST

PLANTING SITES

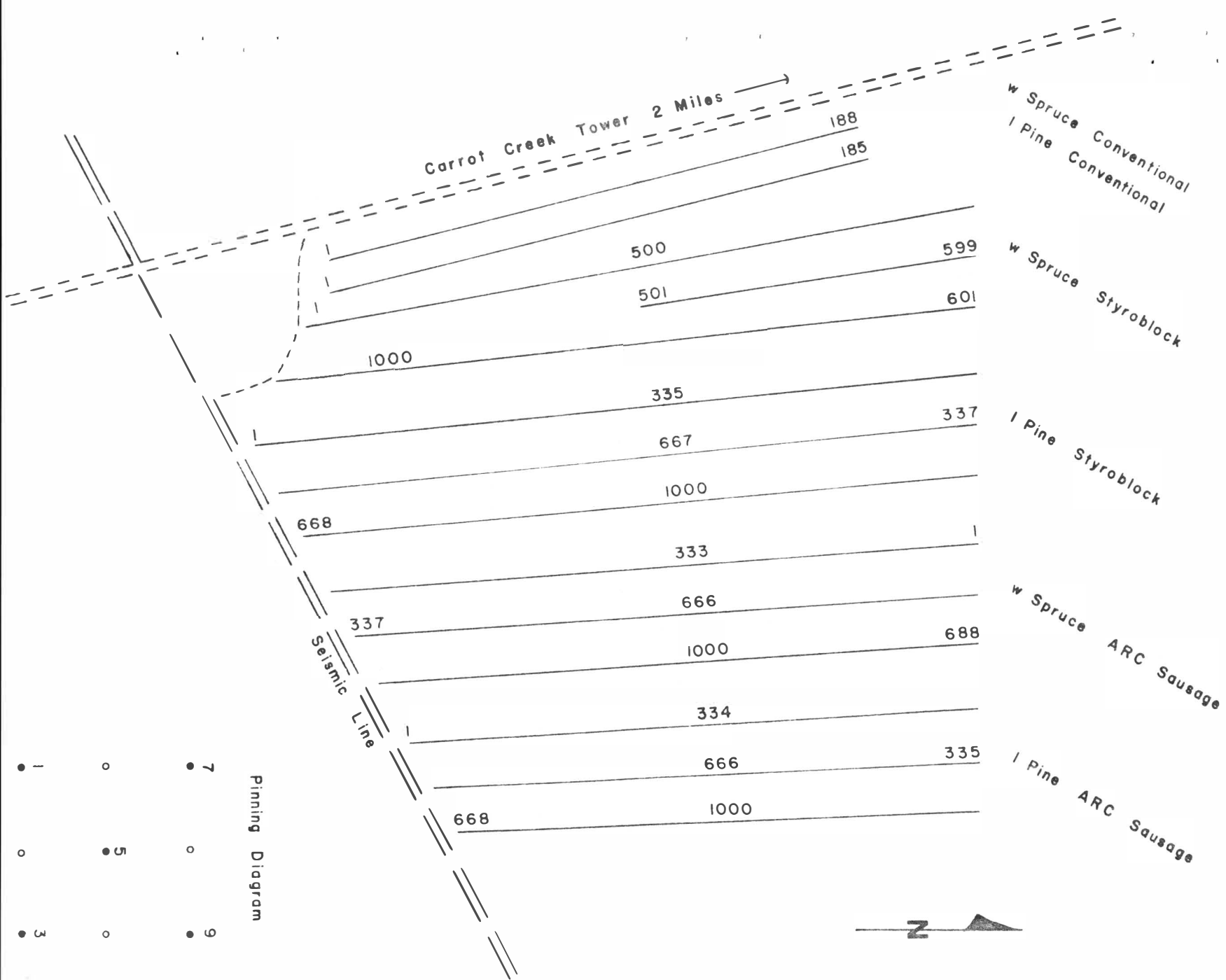


● Container Planting 1971-

Scale 1" = 4 Miles

WHITECOURT FOREST

Planted July 20-23, 1971



WHITECOURT FOREST



Planted July 11-14, 1972
2 rows per scarified strip

Carrot Tower 1.5 Miles →	1-200	w Spruce Conventional	
	1-200	1 Pine Conventional	
	1-250		
		w Spruce Styroblock	500-251
			750-501
			1000-751
			250-1
	251-500	1 Pine Styroblock	750-501
			1000-751
	1-250		
		w Spruce ARC Sausage	500-251
			750-501
	751-1000		
			250-1
	251-500	1 Pine ARC Sausage	750-501
	751-1000		

Bow Forest

1971 Plantings

Site location - From Red Deer Ranger Station, east 3 miles to Shell sign (Burnt Timber No. 2), north on this road 1.9 miles to plot site. Twp. 31 Rng. 9 Sec. 14 West 5 Mer.

Species - conventional lodgepole pine - yellow labels

Styroblock lodgepole pine - orange labels

RCA sausage lodgepole pine - blue labels

Planting conditions - Seedlings planted July 28 - 30 on scarified cut over block. This block was fully scarified. The weather was very hot and dry. Soil was dry and planting was difficult due to flat sandstone and shale rock just under soil surface. Vegetation was fairly dense and consisted of grasses and fireweed.

Bow Forest

1972 Plantings

Site location - Next cut block north from 1971 planting site (See 1971 site location).

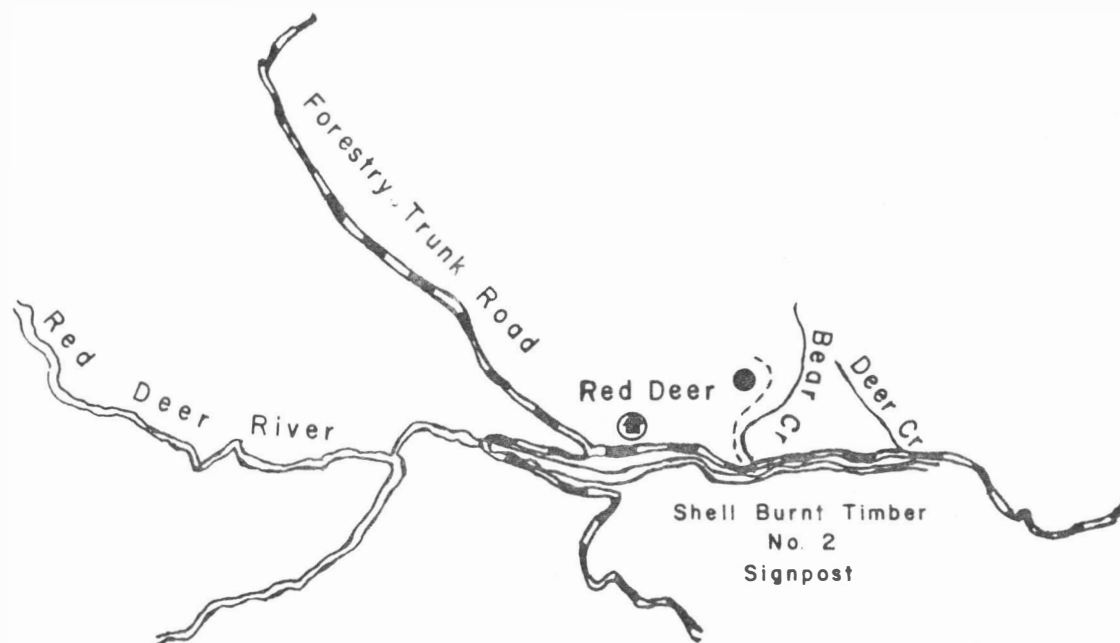
Species - conventional 3-0 lodgepole pine - yellow labels

Styroblock lodgepole pine - orange labels

RCA sausage lodgepole pine - blue labels

Planting conditions - Seedlings planted June 20-23 on scarified cut over block. The block was fully scarified. Vegetation was heavy and consisted of grasses, herbs and fireweed. Soil moisture was excellent as it rained most of the planting period. Planting was difficult due to flat sandstone and shale rock just below soil surface.

BOW FOREST
PLANTING SITES



● Container Planting 1971-73

Scale 1" = 3 Miles

BOW FOREST



Styroblock

Conventional

ARC Sausage

Planted July 28-30, 1971

Lodgepole Pine

ARC Sausage

Conventional

Styroblock

Planted June 20-23, 1972

Lodgepole Pine

(3X3 feet)

751	1000	
501	749	
	499	251
1	249	
		183
	1	249
	499	251
501	749	
1000	751	

Uncut strip

(3X3 feet)

	1000	667
	665	337
	335	1
175		1
1	333	
335	667	
	1000	669

Uncut strip

Lac La Biche Forest

(Calling Lake) 1971 Plantings

Site location - From Calling Lake Ranger Station, north to airstrip corner, east half the length of the airstrip and then north. Total distance from Ranger Station, approximately 3 miles. Twp. 72. Rng. 21 Sec. 20 West 4 Mer.

Species - conventional 3-0 white spruce - white labels

Styroblock white spruce - pink labels

RCA sausage white spruce - red labels

Planting conditions - Seedlings planted July 28-30 on scarified strips. Weather was hot and dry 80° - 90°F. Silty loam soil was very dry during planting period. Scarified strips were re-scarified the spring of 1971 as heavy vegetation and grass growth had created too much competition for seedlings.

Lac La Biche Forest

(Calling Lake) 1972 Plantings

Site location - Immediately north and in same block as 1971 plantings (see 1971 site location).

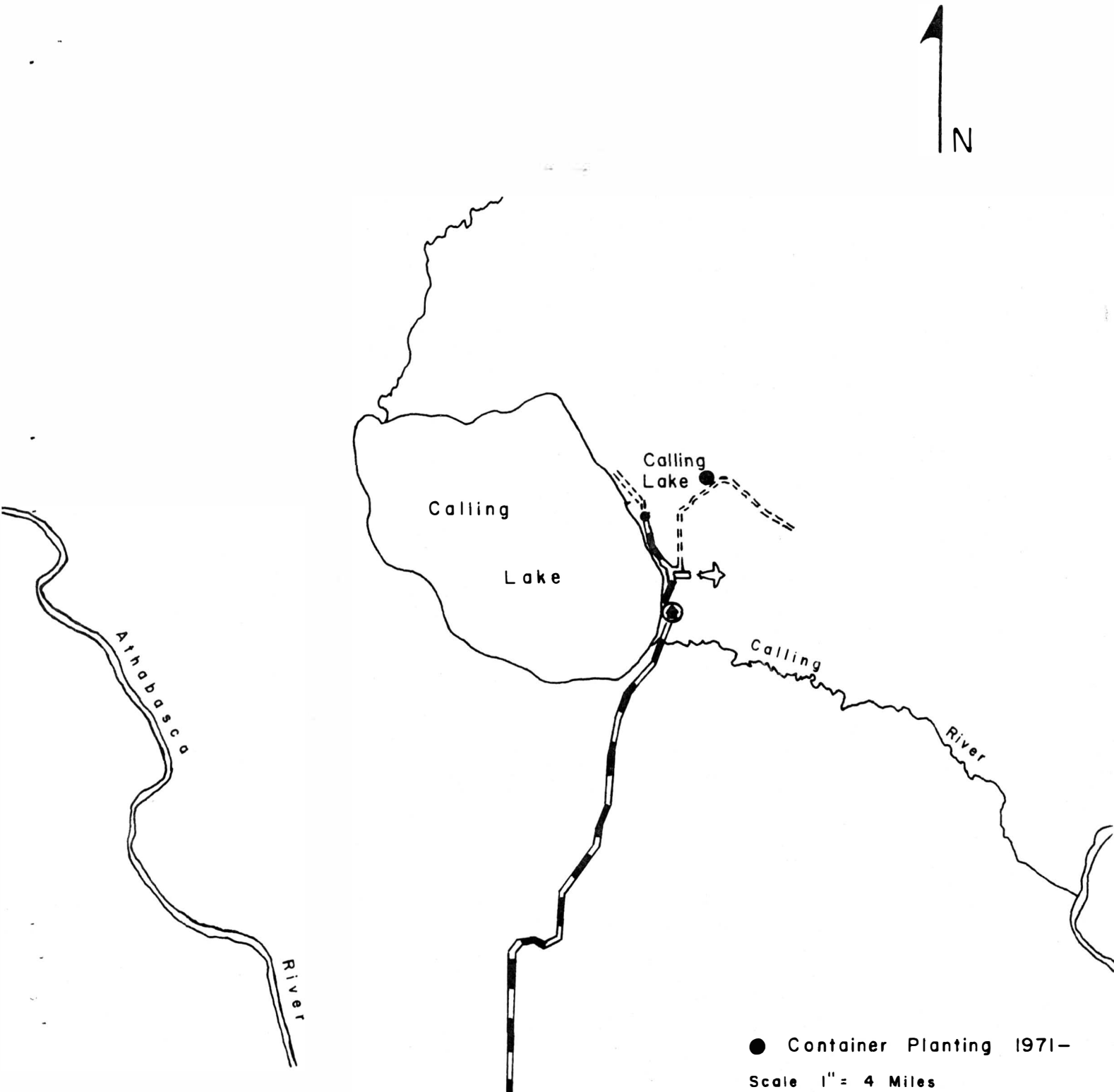
Species - conventional 3-0 white spruce - white labels

Styroblock white spruce - pink labels

RCA sausage white spruce - red labels

Planting conditions - Seedlings planted June 28-29 on scarified strips. The strips were rescarified spring 1972 to eliminate heavy grass and vegetation growth. Enough strips were re-done to accommodate the 1973 plantings as well. Vegetation at time of planting was minimal and soil moisture excellent due to rain during planting period.

LAC LA BICHE FOREST PLANTING SITES



LAC LA BICHE FOREST

Conventional

Styroblock

ARC Sausage

White Spruce

Planted July 28-30, 1971

ARC Sausage

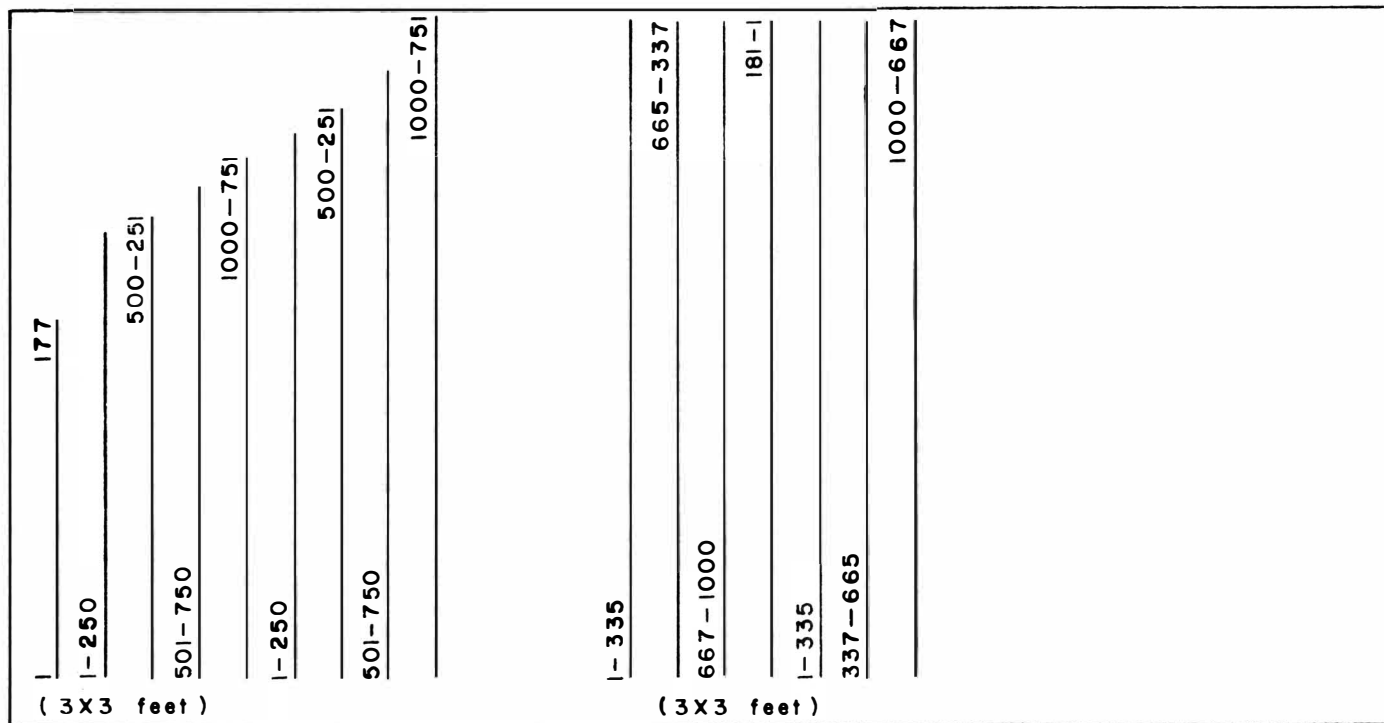
Conventional

Styroblock

White Spruce

Planted

June 28-29, July 4, 1972



← Calling Lake

Grande Prairie Forest

1971 Plantings

Site location - Grovedale Ranger Station, 15 miles south of Grande Prairie.

Twp. 69 Rng. 6 Sec. 32 West 6 Mer.

Species - conventional 3-0 white spruce - white labels

conventional 3-0 lodgepole pine - not available

Styroblock white spruce - pink labels

Styroblock lodgepole pine - orange labels

RCA sausage white spruce - red labels

RCA sausage lodgepole pine - blue labels

Planting conditions - Seedlings planted August 4-7 on brush cut area only.

Area has heavy vegetative competition and willow growth. Soil moisture was good for planting.

Grande Prairie Forest

1972 Plantings

Site location - Same clearcut scarified block as 1971 plantings (see 1971 planting site location).

Species - conventional 3-0 white spruce - white labels

conventional 3-0 lodgepole pine - yellow labels

Styroblock white spruce - pink labels

Styroblock lodgepole pine - orange labels

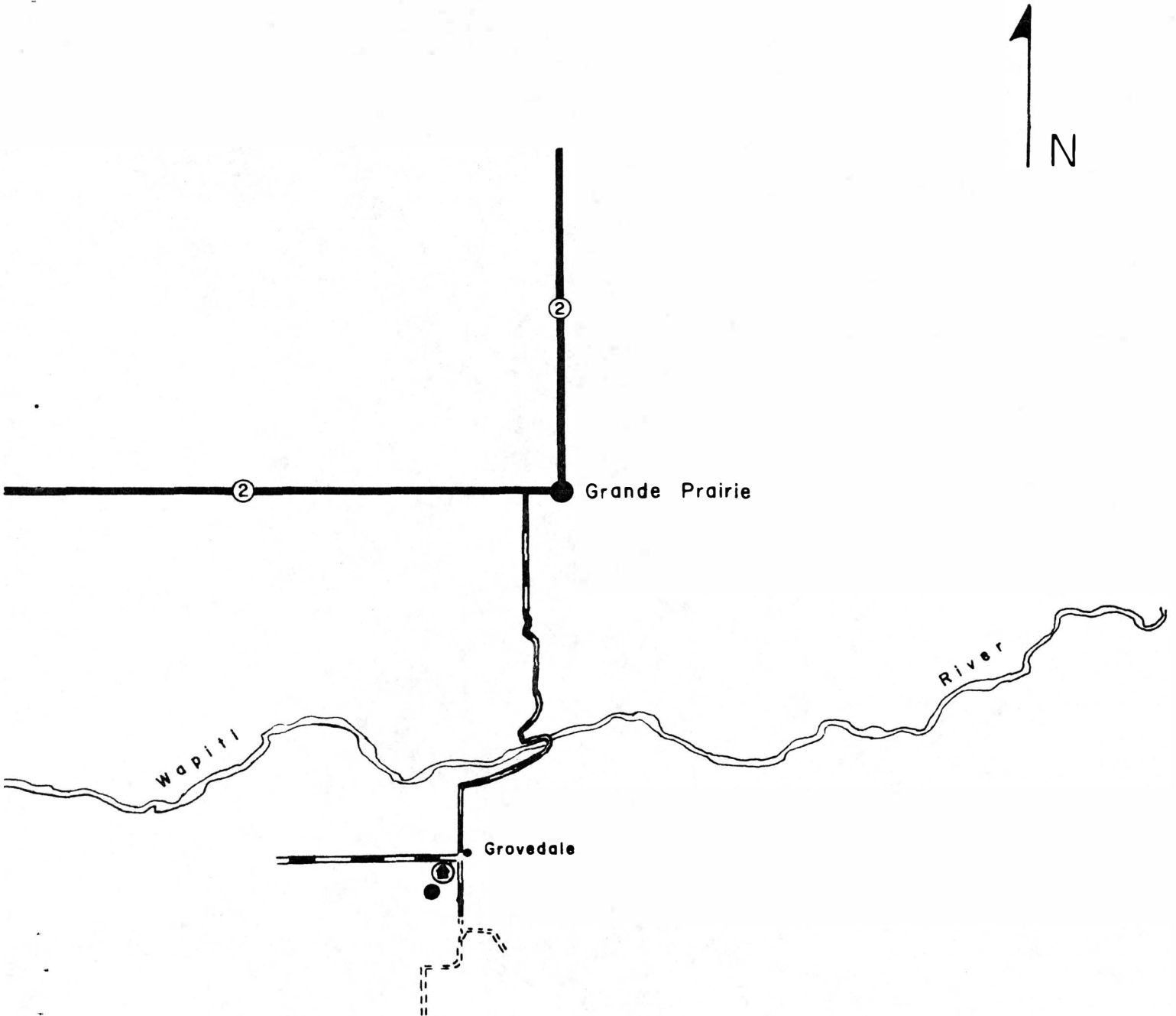
RCA sausage white spruce - red labels

RCA sausage lodgepole pine - blue labels

Planting conditions - Seedlings planted June 14-21. Area was lightly re-scarified in spring 1972 to eliminate heavy grass and willow competition. During planting period moderate vegetation was present, soil moisture was good.

Seedlings were planted two feet apart - every second tree is pinned and numbered. Rows are three feet apart for plugs and six feet apart for conventional stock. The 1972 planting site was fenced to control rabbit damage to seedlings.

GRANDE PRAIRIE FOREST
PLANTING SITES

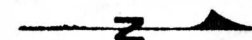


● Container Planting 1971-
Scale 1" = 4 Miles

GRANDE PRAIRIE

Planted August 4-7, 1971

876-1000		875-751
626-750		625-501
376-500	1 Pine A R C Sausage	
251-375		250-126
		125-1
<hr/>		
		1000-876
		875-751
		750-626
	w Spruce A R C Sausage	625-501
		500-376
		375-251
126-250		125-1
<hr/>		
876-1000		
751-875		750-626
501-625	1 Pine Styroblock	500-376
		375-251
		250-126
		125-1
<hr/>		
876-1000		
751-875		750-626
		625-501
	w Spruce Styroblock	500-376
251-375		
126-250		125-1
<hr/>		
		200-101
	w Spruce Conventional	100-1
<hr/>		
Buffer strip		



101-189	w Spruce Conventional	100-1
1-100		
101-188	I Pine Conventional	
		100-1
101-200		
201-300		
		400-301
		500-401
	w Spruce Styroblock	600-501
		700-601
701-800		
801-900		
		1000-901
		100-1
		200-101
201-300		
301-400		
		500-401
501-600	I Pine Styroblock	
		700-601
		800-701
		900-801
901-1000		
1-100		
101-200		
		300-201
301-400		
		500-401
	w Spruce A R C Sausage	600-501
		700-601
		800-701
		900-801
901-1000		
1-100		
		200-101
201-300		
301-400		
		500-401
501-600	I Pine A R C Sausage	
601-700		
701-800		
801-900		
		1000-901

GRANDE PRAIRIE
Planted June 14-21, 1972



Crowsnest Forest

1972 Plantings (no planting in 1971)

Site location - Follow the Carbondale River east to the boundary gate. Just inside gate take seismic line north half a mile to site. Planting area is fenced. Twp. 6 Rng. 3 Sec. 16 West 5 Mer.

Species - conventional 3-0 engelmann spruce - white labels

conventional 3-0 lodgepole pine - yellow labels

Styroblock engelmann spruce - pink labels

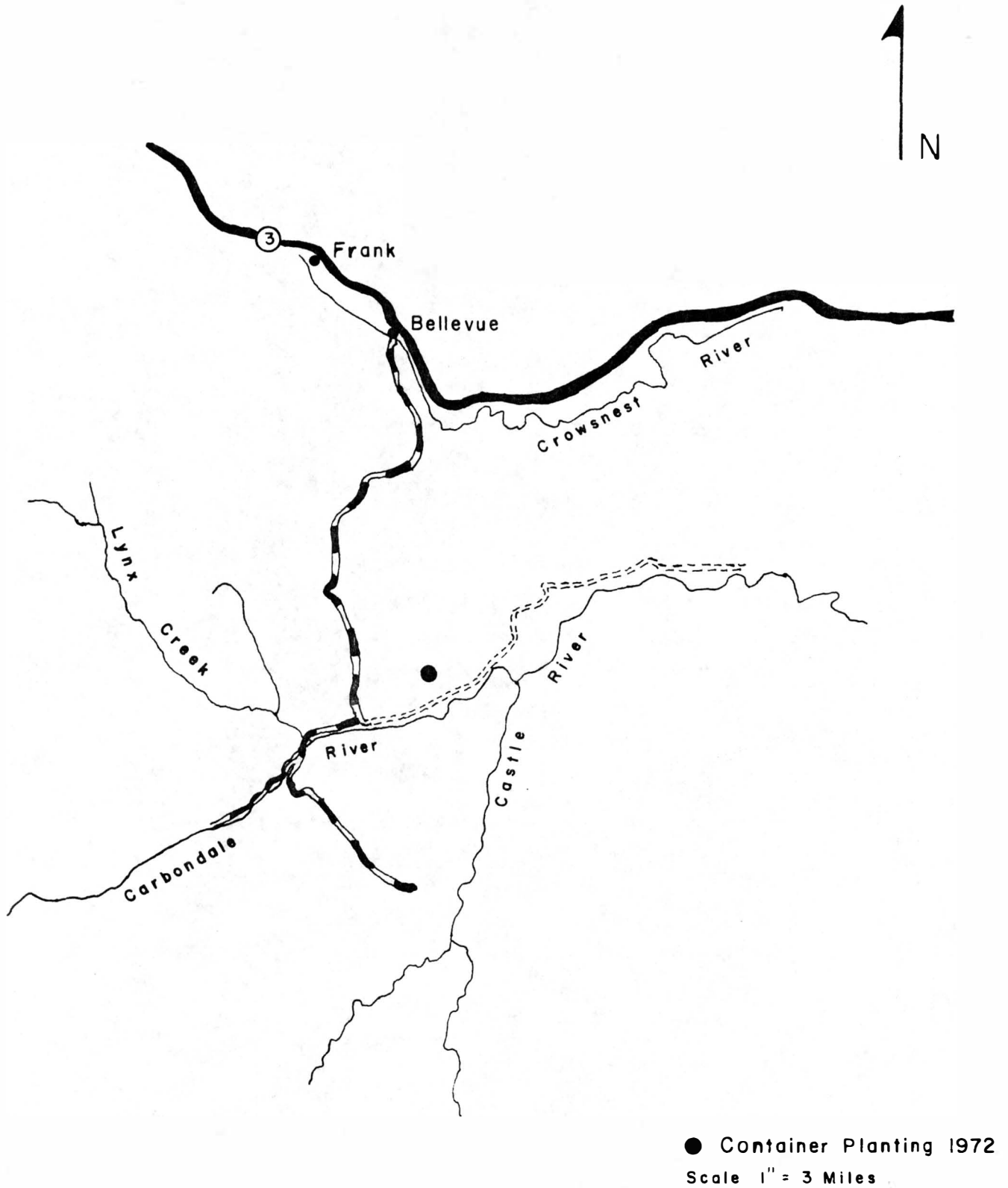
Styroblock lodgepole pine - orange labels

RCA sausage engelmann spruce - red labels

RCA sausage lodgepole pine - blue labels

Planting conditions - This site was not planted in 1971 due extremely dry planting conditions. The planting site is mature aspen and lodgepole pine that has been strip scarified. Vegetation is heavy, with grass and herb. Seedlings planted June 13-16, 1972. Soil moisture was excellent and the weather cool. Heavy aspen suckering is occurring on scarified strips.

CROWSNEST FOREST PLANTING SITES



CROWSNEST FOREST

Planted June 13-16, 1972



1000	671			
669	337	Engelmann	Spruce	Styroblock
335	1			
1000	503			
501	1	Lodgepole	Pine	ARC Sausage
1000	503			
1	501	Lodgepole	Pine	Styroblock
1000	668			
335	666	Engelmann	Spruce	ARC Sausage
1	195	Lodgepole	Pine	Conventional
1	333	Engelmann	Spruce	ARC Sausage
185	1	Engelmann	Spruce	Conventional

Pinning Diagram

4
○ 3
●
2
○ 1
●

(2 X 2 or 3 X 3 feet)

Yukon (Watson Lake)

1972 Plantings

Site location - From Watson Lake north on Highway 9 to mile 13 post. First turn west for 2.6 miles, north 1.2 miles to Tom Creek, walk from there along old skid road on banks of Laird River 2/10 mile to planting site.

Species - Styroblock black spruce - pink labels

Styroblock lodgepole pine - orange labels

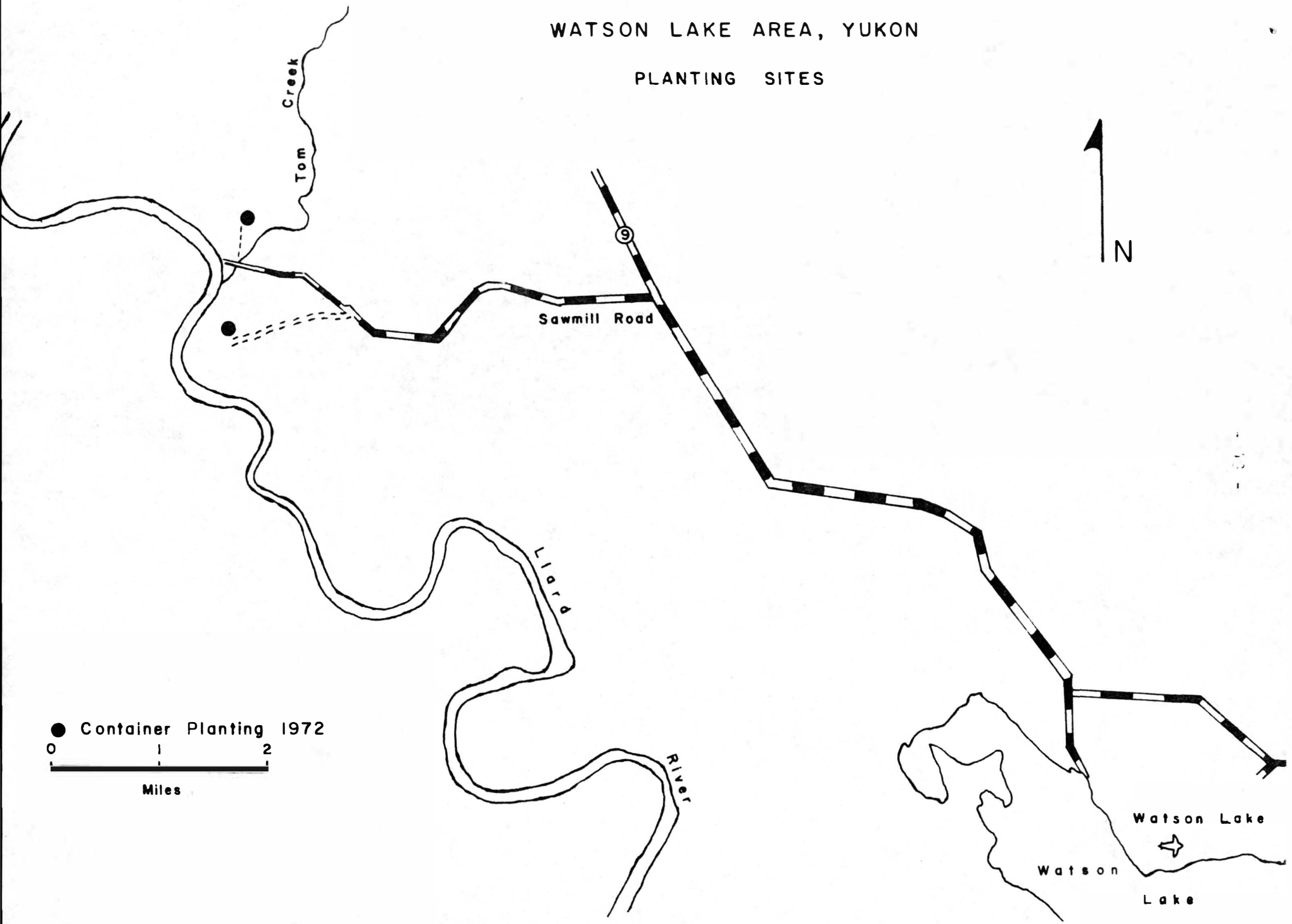
Planting conditions - 1400 seedlings of each species were planted July 20 on terrace along the Laird River. Planting was done on scarified strips which were bladed immediately before planting. Site was a burned over terrace with sandy to silty sand soils. Moisture was excellent with showers during planting.

On July 21, 313 seedlings of each species were also planted on a flood plain adjacent to an old mill site 1.4 miles further west along main access road to terrace site. (see location map).

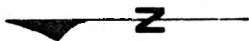
Soils were hard grey silty clay loams. Seedlings were planted on skid trails on logged over site. Trails had moderate vegetation and good moisture.

WATSON LAKE AREA, YUKON

PLANTING SITES



NORTH OF TOM CREEK



Planted July 20 - 21, 1972

1201	1306
1199	1001
801	999
799	601
401	599
399	201
	199
1401	1201
1199	1001
801	999
799	601
401	599
399	201
	199

4	3
0	●
2	1
0	●

(3 x 3 feet)

WATSON LAKE AREA, YUKON

FLOOD PLAIN

Planted July 21, 1972



197

Lodgepole Pine
Styroblock

199

313

135

137

Black Spruce
Styroblock

313

Pinning Diagram

3	4
●	○
1	2
●	○

(3 X 3 feet)

Northwest Territories

1972 Plantings

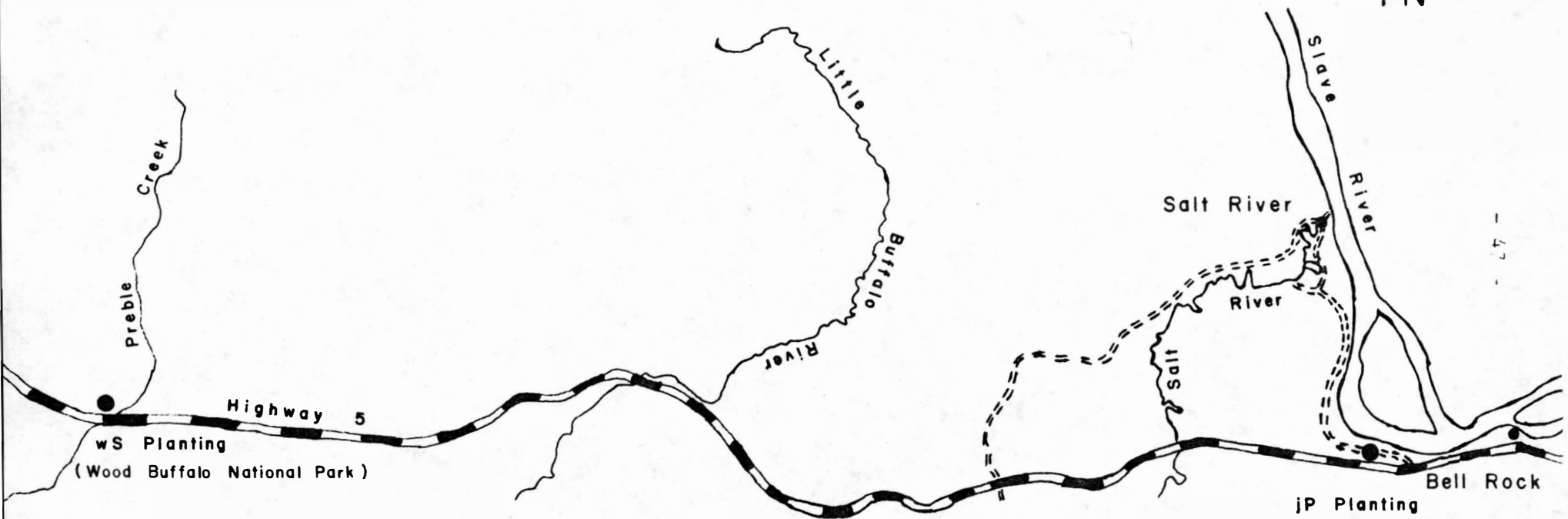
Site location - From Ft. Smith (Portage Ave. & Highway), west on Highway 5 to trail going to old Sawmill site - 11.65 miles. Trail to site is located on north side of highway. 300 yards along this trail to clearing by the old Sawmill site.

Species - Styroblock jack pine - orange labels

Planting conditions - 2000 seedlings planted June 29 on a cutover site. 1000 of these were planted in rows of 50 with every second seedling pinned and numbered. Spacing was 2 x 2 feet. The other 1000 seedlings were planted off to one side (see planting diagram) in six rows. These seedlings will be sampled periodically for root-shoot development.

The planting site had moderate vegetative competition and some exposed mineral soil through logging. The soil was sandy silt with a shallow duff and moss layer on undisturbed spots. Soil moisture was moderate to dry.

FORT SMITH
NORTHWEST TERRITORIES
PLANTING SITES



● Container Planting 1972

Scale 1" = 4 Miles

FORT SMITH
NORTHWEST TERRITORIES



1-50	100-50	1000-950	1000 unpinned seedlings
101-150	200-150		
201-250	300-250		
301-350	400-350		
401-450	500-450		
501-550	600-550		
601-650	700-650		
701-750	800-750		
801-850	900-850		
901-950			
Styroblock Plugs			
Jack Pine			
2 X 2 foot spacing			
Planted June 29, 1972			

300 yds

Fort Smith → 11.6 Miles

