

11

DIRECTIONS FROM PRINCE GEORGE AIRPORT  
TO SWEDISH PROGENY SITE IN FORT ST. JAMES

Leave airport following signs to Prince George. Turn right on Highway 97 follow signs to Prince George. Turn left at intersection of Highway 97 and the Highway 16 follow signs to Vanderhoof. (Highway 16 West). Drive through Vanderhoof on Highway 16 West to the Highway Truck Scale. Turn right on Highway 27 and follow signs to Fort St. James.

Drive through Fort St. James on Highway 27 following signs to Manson Creek and Germansen Landing.

\* Cross over the railway tracks and the pavement ends. Follow dirt road for approximately 3.5 km and turn right. Sign posted for Teardrop Forest Road. Follow road until it crosses over railway tracks again and then turn left onto the Main Teardrop Forest Road. (Radio controlled traffic).

\* Alternate Route through Mill Yard

At railway tracks north of Fort St. James turn right on Takla Road into Mill Yard. Follow → on sketch map. Radio controlled traffic starts at the Scale House, please drive with caution and follow radio controlled vehicles.

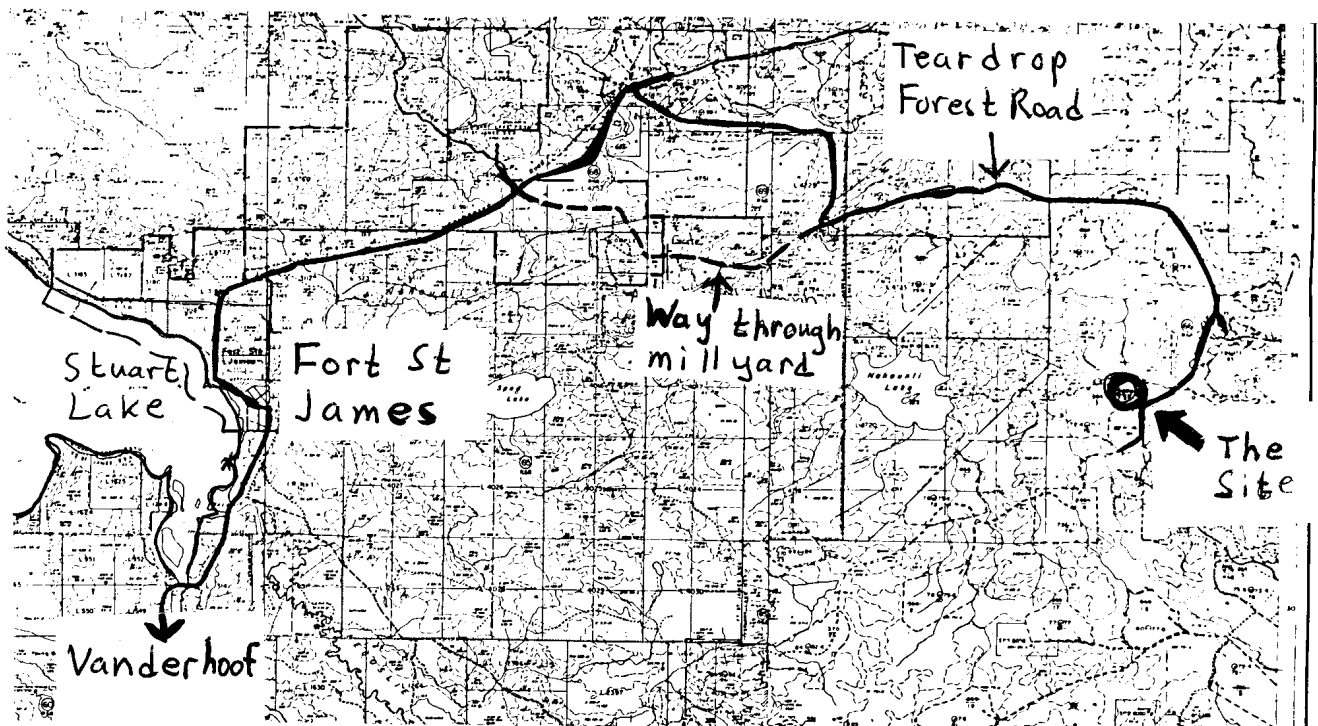
Proceed along Teardrop Forest Road to 13 km, following sign boards along roadside. Only major intersection is at 11 km - keep to the right. Do not follow 100 km signboards. Drive past 13 km Teardrop Forest Road and turn right after driving up the hill for approximately 0.2 km. Landing immediately on right hand side is adjacent to the site and contains the project sign.

Fort St. James - Contacts

Canfor Takla Office: ~~996-8241~~ **936 5401**  
~~John Sanford Local 217 (Home 996-7688)~~  
Juha Salokannel ~~Local 220~~ (Home 996-7076)  
Joseph Paques ~~Local 259~~ (Home 996-7098)

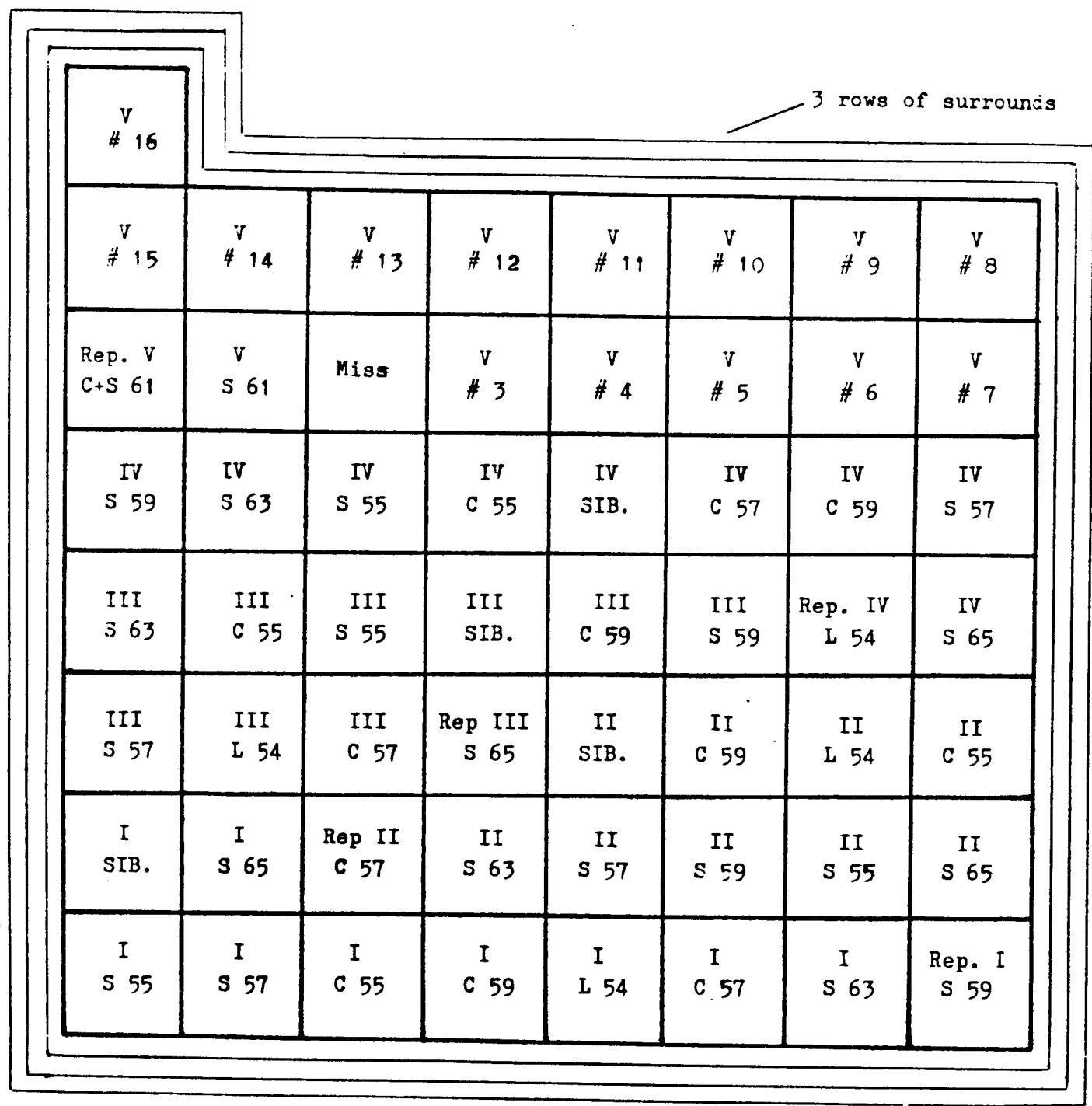
Prince George - Contacts

~~Canfor Takla Office: 561-3600~~  
~~Bob Baker: 561-3602 (Home 565-8684)~~



# Fort St. James

Fort St. James



336°

66°

scale 1:1000(approx.)

sign for site

DL 900827

**Canadian-Swedish project. Site sheet for Mackenzie site.**Contact person (organization):

Dave Lehane, RPF  
 Forestry Superintendent  
 Fletcher Challenge  
 Mackenzie Forest Management  
 Bag 25000  
 Mackenzie, BC, VOJ 2CO  
 (604) 997-3075, alt gen switchboard 997-3271, res 997 4629  
 fax 997-5292

Jack Toovey is replaced by Don McMullen.

The office is on the road to BCFP Industrial complex, to the west around 3 km before Mackenzie, Mackenzie Forest Management Group.

Location: Lat 55°30' Long 123°26' Elev 680 m.

Nation Bay

35 km NW from Mackenzie

The site is 10-20 m above Williston Lake.

South shore of Nation's Bay on Williston Lake, UTM Grid 10.47.615, map sheet 930, Mackenzie, provincial 4 mile series, ca 1 km west of Dastaiga mainline, just before Nation's Bay bridge (km 65).

In BCFP licence area, Timber Sale Harvesting licence A 00156, C P 106, Finlay Timber Supply Area.

Description of way: Note that the zero point of km-signs changed 1989. The site is approached via a road on the western side of the southern part of Williston Lake, Finlay Nation Forest Service Road. The road may be entered either by passing to the south of Williston Lake (Around 100 km drive from Mackenzie to site), or by using a ferry (around 43 km). It is also possible to reach the site from Ft St James from the west via Germanson landing without passing Mackenzie. The road has km sign boards. The ferry starts from below the BCFP industrial complex, just drive through the complex. The ferry joins the road at km 33. Drive north. At km 63 the road joins a road to Ft St James (181 km). At ca 64.5 take smaller road to the left in right curve. If you continue the main road, a Bridge over National River is passed after 500m. At km 71.5 to the right there is a swamp and abandoned experiment initiated by Owe Martinsson. At km 72.5 to the right is a gravel place, 100m to IUFRO lodgepole provenance trial. After turn at 64.5, proceed 700m (West). Main way stops at gravel plain close to water, continue to left (SW). The way ends after some hundred ms into a turning plan, water is visible. Track southward (left) 100m to the trial.

Particular about access: There is no closer accommodation than Mackenzie, e g Alexander 997-3266. 1.5-2 hrs drive from the site.

Soils and site details: Medium to coarse sand, some gravel and a thin 1 cm organic layer. The plot is located on the western edge of a small clear cut, and is within 100-500 m of a mature

lodgepole stand, with black spruce in the area. There is also black cottonwood and aspen in the mature timber stand in close proximity to the plot.

Site history: The area was logged in 1980, drag scarified in 1982. The surrounding area was planted with lodgepole pine in 1985. (As a complement to natural regeneration, which was not always satisfactory.)

Experimental history: Planted late May 1986. Naturals removed 1988 (almost complete removal, some were too big, some left in larch plots). Measurements 88. Besides height and condition, presence of bent leaders were registered in block V, by adding a 5 after the condition classification figure.

Field notes:

CC 85: Two wide shallow ditches run through the site making some subblocks wetter than others.

Pat inv 86 (Turnquist): rather extensive comments, see their document for details if interested.

MK 86: good condition, good growth. Some siberian larch in bad shape.

CC 87: 98% survival (best) and 7% frost damage. In general less healthy trees than on other BC sites. The larch in particular was affected. Brush problems were evident but not wide-spread.

DL 88: Excellent survival, rather slow growth. Not much competition, only little and not dense grass, some brush, particularly aspen, disturbs some plants. The worst brush are the sprouts from trees mechanically cleared away 1986. Naturals seem to grow better than planted lodgepole. Around 5-10% of the southern Scots pine (S57) got bent leaders, Melampsora?? The northern Scots pine looked healthy, undamaged, straight. S63 seems optimal if absence of damage is the most desirable criteria. S65 loses a little in growth. The more southern pines get more problems with leadershifts. The needle colour becomes more yellowish and more similar to lodgepole. S57 does not seem quite healthy, thus the optimal provenance of Scots pine originate from between latitude 59 and 63. Only few lodgepole pines are affected by bent leaders. The lodgepoles are higher and have longer needles with a more yellowish colour. Not much prolepsis. On one experimental lodgepole plant a big stem gall was observed. The larch was bushy, hardly a single plant without die-back on some shoots. Otherwise remarkably little damage the last year. Very few of the spruces looked good. No evident health problems besides that what was mentioned. Easy to measure as stakes, plants and pegs are easily identifiable. Thus this site is the most suitable for more extended special inventories. Probably damage is sufficiently reflected in three years heights. We found a valet with a drivers licence (Brown) etc on the site, evidently lost during planting 1986 (mailed to address on licence).

Pat inv 890717. Healthy, good growth except larch. About 25% of the larch suffered from frost damage, resulting in bushy, stunted form. Approximately 25% of the lodgepole had light winter flecking, and some 5% of the lodgepole had multiple tops.

BZ 89 need for removing some sucklings

DL 90 Some naturals has grown much in the last two years. It

comes in naturals of spruce. Orientation is easy, but some centerstakes has fallen down. Condition of experiment is very good. Growth is slower than at Ft St James, the highest pines are around 1m. The larches had recovered, and now looked rather fine. Around .5 % of the plants have died during the last two years, one reason is an insect debarking the root collar. Competition is light, a few high brush may disturbe a few plants. There are Scots pines with small shoots developing at the bottom of the stem. The same thing can be seen on lodgepoles in Sweden. Surprising, it is the exotic pine which gets it in both countries!

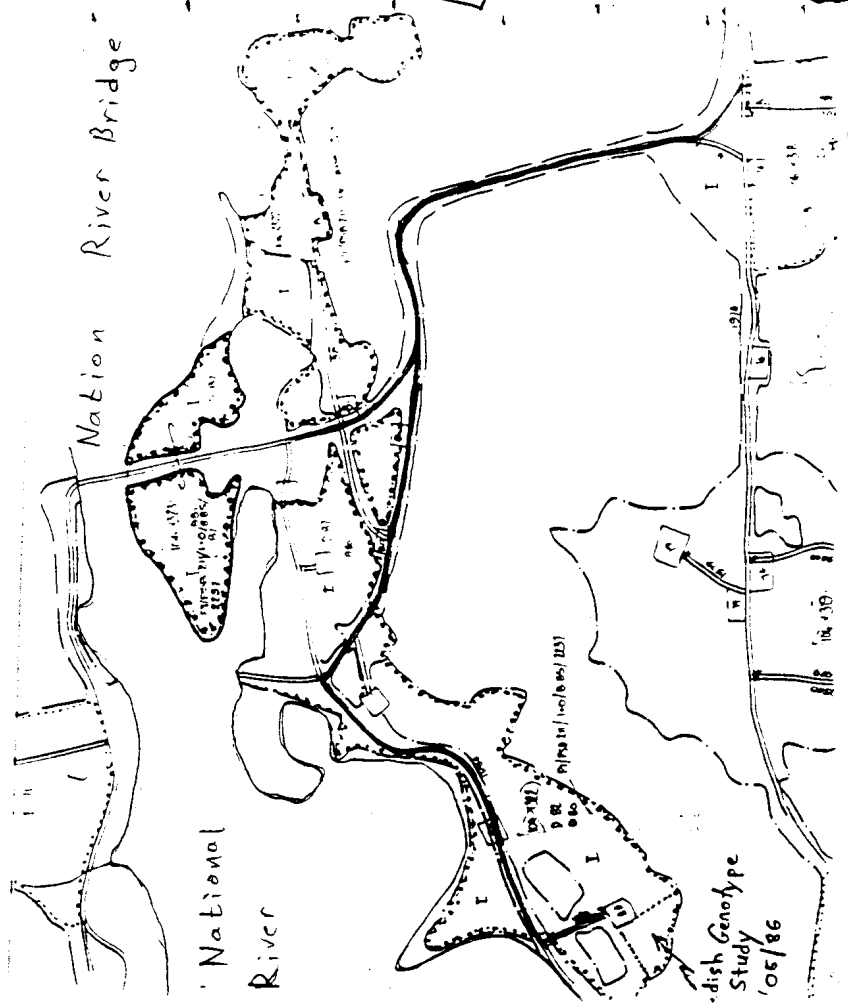
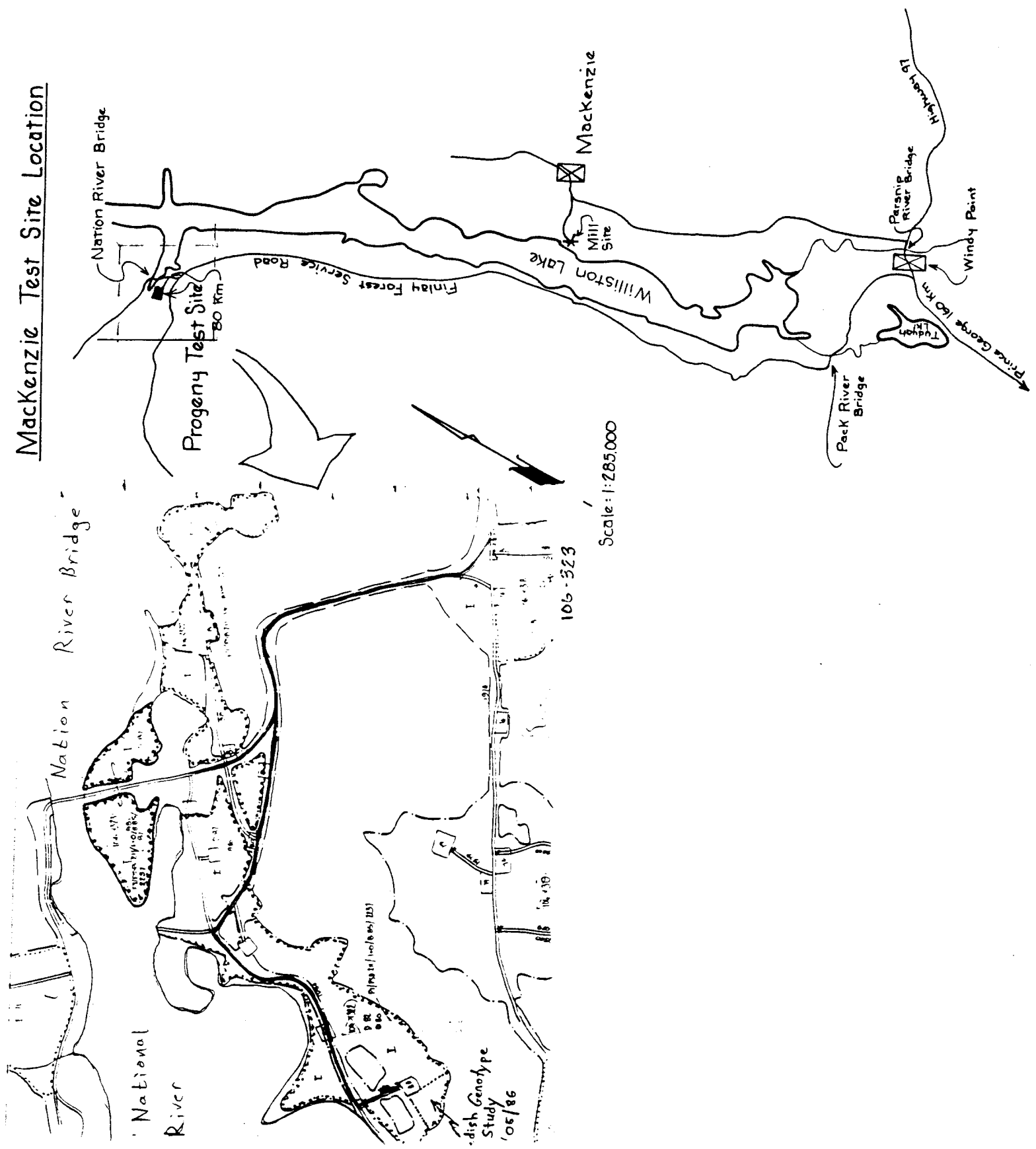
There were lots of stem rusts on the lodgepoles, only a few galls on Scots pine. There were at least three rust species, among them the most common and interesting (Western gall rust, Comandra rust, Stalactiform rust). Several tens of the lodgepoles were attacked to varying degrees. This proves that Scots pine is exposed. As several visits were made the last few years, the attacks must have increased the last year.

Management See measurements.

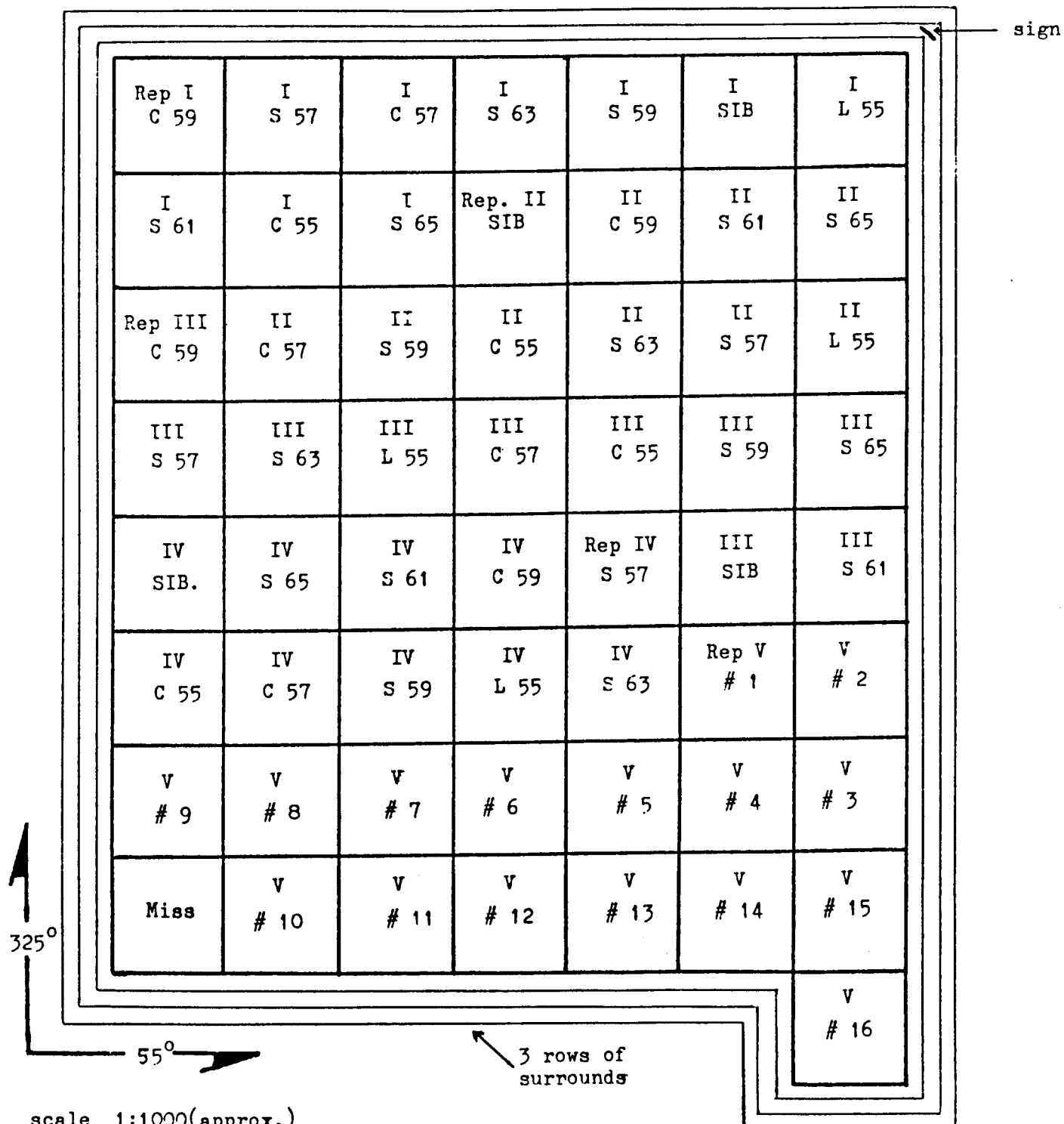
Big clearly visible corner stakes would make it easier for visitors to identify where the experiment is.

Suggested measurements: It was agreed that the rust attacks are very interesting and ought to be documented, preferably in June 1991. That would serve two purposes: (1) Documentation of the differences in build up between the two pine species. (2) Genetic variation within lodgepole. The study hits in the right phase: many - but not all - plants are infected. The study ought to be of considerable BC interest as the genetic structure of the experiment makes it extremely well fitted for studies of genetic variation and as it is a site and genetic materials typical of what is economically significant to BC. At the same time spend three hours on removing disturbing brush and remaining naturals and raise center stakes. Dag Lindgren will supply the experimental files to Bart van der Kamp (M Karlman has already got them). It is important that new data are reported so they easily can be combined with old data, for 1991 inventories I suggest that 1988 files are printed to paper, 1991 data are catched on those sheets, and 1991 files are created by just adding 1991 year data. Report to Dag Lindgren on what was done and what remains to be done.

# Mackenzie Test Site Location



Mackenzie



scale 1:1000(approx.)

- S61 = Scots (Swedish) pine, origin lat. 61°
- C59 = lodgepole (Canadian) pine = *Pinus contorta*, origin 59°
- N59 = Norway Spruce
- SIB = Siberian larch
- L54 = local lodgepole pine stand seed

DL 900829

**Canadian-Swedish project. Site sheet for Ft St John site.**Contact person (organization):

R M Clarke, Woodlands manager  
 Canadian Forest Products Ltd  
 Fort St John Division  
 Box 6280  
 Fort St John  
 BC V1J 4H7  
 tel (604) 785 8906 : home: 787 7683

Rixon

Location: Lat 56°12' Long 122°13' Elev 770 m ? BCs guess.

Halfway River

about 90 km WNW from Fort St John, 1 2/3 hrs drive.

Description of way: Alaska hwy km 152, north of Ft St John, south of Wonovon, take west Upper halfway river road, sign "Upper halfway 37", (Upper halfway Rd 117) (there are km sign boards), 40.5 km from junction to the right (north), Canfor, Petrocanada, uphill. Passes some petrochemical plants. 5.2 km from junction (km sign boards on road) turn right from road (east) out on big clearcut from 1984/86. After 700 m the site is immediately to the left within a barbed wire cattle fence.

Particular about access: No keys required. 45 km dusty gravel. Log trucks. Cows. Accessible by personal car or camper. Closest accommodation Wonovon, 1 hr drive away, motel e g Blueberry Motel 772-3322.

Soil and site details: Soil is medium to coarse sand with gravel, some silt particularly in low areas, and a thick (up to 10 cm) organic layer, especially where not disturbed. Some of the mineral soil is exposed. There are wet low pockets, some of them were blocked out at planting. Note that "up" on the site map and "up" on the plot maps are differently oriented (NNW).

Site history: The plantation is situated near the centre of a 100+ ha cutblock, identified as Block 1 of C.P. 104, under licence to CanFor in Fort St John. The site was logged in 1984/85 and drag scarified in September 1985. Coarse gravel soil affords good drainage and, prior to logging, supported a dense stand of lodgepole pine with black spruce as a minor component. The opening is surrounded by stands of trembling aspen and lodgepole with black spruce as minor component. There is several hundred m distance from the trial to the old forest.

Experimental history. Big slash was pushed out from site before planting. Planting in June 1986.

After planting fencing with barbed wire to keep cattle out. Deer and hare may pass fence.

87 some corrections in planting, white plastic sticks.

88 height and condition registered, diameter in block 5, removal of many of the naturals (2/3).



89 Clark removed further naturals, but no competition control was done.

90 Clark got money from Ministry of Forests for a crew working with removal of brush and naturals and roundup treatment to keep grass down. This work was done in late August, and was almost complete when we visited the site.

Field notes:

CC 85: Extensive natural regeneration from cones on ground expected.

Pat inv 86 (Garbutt): Western gall rust infections were severe with five or more branch and/or stem galls per tree in the logged stand. Lodgepole pine in surrounding stands is also infected, and will provide an abundant source of inoculum. No observations of stalactiforme and Comandra blister rust in vicinity. Indian paintbrush common. Comandra plants not seen.

MK 86: Wet pockets. In the wetter region a lot of dead Norway spruce seedlings were observed.

CC 87: Survival 97%. Condition of stock very good. The brush will require attention. In the north east corner of the trial grasses and sedge will be troublesome, and woody perennials are sporadically present throughout. Problems with wet pockets continue. Some plugs were tossed out by frost action, and others were planted too low initially.

DL 88: Competition of variable seriousness, least in southern part. Takes a lot of time to find experimental plants sometimes. At present high grass in some spots is worst. (Might be it is not only a blessing to keep cattle out?). Brush come and will disturb. Deer inside fence, no problems to jump over (around 140 cm barbed wire). Deer browsing is one cause of damage to lodgepole in Sweden. Surprisingly few naturals compared on part of the area, after my removal no need for removing more in the next two years. The surrounding felling is expected to be regenerated by lodgepole cones in the slash, but little regenerations seem to be coming, it seems to be much more in the trial. Is it due to larger disturbance of the organic soil in the trial? The plants are healthy, no decease, no pathogen, very little recent damage, no needle damage, they keep previous years needles. A few leadershifts. Some prolepsis, some elongated needles. Tossing of plugs is visible, but does not seem to be a problem any more. Lodgepole pine is better than Scots pine.

It takes long time to find some plants: Suggested remedy: put colour on top of stakes before next inventory (they are grey and difficult to see), remove big brush. Brush control also desirable to keep survival high.

DL 90: Removal of naturals and brush was going on. Bob Clarke reported around 6000 naturals per hectare, and the remaining naturals were more and bigger than I predicted 1988. I found satisfactory regeneration outside the fence, which I did not see much of 1988. Thus, it is clear that it is a considerable chance that the role of naturals from cones in the remains from loggings is underestimated four seasons after logging, and that six seasons are necessary.

There are some cases where the square grid pattern was not followed at planting.

There are brushes, which now are being removed. There was among other species *Alnus crispa*, which may improve site index by

nitrogen fixation.

There are cones (even two year cones) on some of the lodgepoles. Top pines reach 170 cm and top larch 200 cm.

There were many cases where the current year's leader shoots of the larches were dead and another leader has taken over. Presumably some kind of rather mild weather damage.

There are plant losses for different reasons, but less than 10%. Some plants are just missing.

Pitch moth was found.

There is Western gall rust on a low percentage (<2)) of the lodgepoles, no on the Scots. No reason for an immediate inventory. The galls do not kill the trees but form an attractive niche for insects and secondary pathogens which later are likely to kill the tree. No other rust than Western gall rust was found.

Most plants are in very good shape.

There is some type of short needle syndrom on around 5 percent of the lodgepoles. Some needles are short, mostly 1989 needles, sometimes 1990 needles, sometimes the whole tree. The syndrom exists on all three sites visited so far. Late shoots (prolepsis) were found. High mortality was recorded among the spruce plots, but of the survivors most look well-established and healthy.

Snow shoe hare risk was discussed. A peak is likely to occur the next winter. This experiment is unlikely to be touched as the hares like some type of shelter, and this plantation is in the middle of a clearcut. The experiment itself does not yet give sufficient cover for the hares.

Management suggestion: It seems that there is no particular need of management for the next years when the current operation is over. There will be a few naturals left, which can be taken care of at the next inventory, and a few brush, which we should probably not care about. There are a few doubles, when the crew could not decide which one was the experimental and which was the natural. At next inventory, if there are two lodgepoles and a decision about what is the experimental one can not be made, remove both and call it "lacking".

FORT St. JOHN

