

Stocking Survey on Harvested Area of Managed Forest 167

prepared for: The Private Managed Forest Land Council

prepared by: Nancy Pezel, RPF

March 5, 2009



Introduction

A managed forest inspection was conducted on MF 167 in January 2009. At the time of the inspection it was estimated that approximately 50% of the area harvested in 2001 and left for natural regeneration is not restocked to the required minimum 400 trees per hectare.

The Private Managed Forest Land Council Regulation 2007 (PMFLC Reg) states in Section 31(3): *If all or part of private managed forest land becomes a disturbed area after the area becomes an owner's land, the owner must reforest the disturbed area by:*

- (a) restocking the disturbed area within 5 years of the completion of timber harvesting activity on the cutblock, or the date the timber was destroyed as applicable, and*
- (b) establishing a successfully regenerated stand on the disturbed area within 15 years of the completion of timber harvesting activity on the cutblock, or the date the timber was destroyed, as applicable.*

In the PMFLC Reg:

“disturbed area” means all or part of private managed forest land where

- (a) timber harvesting has been completed within a cutblock, or
- (b) timber was destroyed

but does not include an area occupied by roads referred to in section 13 or logging trails referred to in section 14(1);

“restock” means to establish a stand of trees

- (a) that contains at least
 - (i) 400 crop trees per hectare reasonably well distributed across the disturbed area if the stand is on the Coast;

“crop tree” means a tree that

- (a) is of a commercial species that is consistent with the species of trees specified in the management commitment for use in reforestation, and
- (b) is unencumbered by pathogens;

Islands West Forestry Ltd. was retained by the Private Managed Forest Land Council to complete a stocking survey to determine the stocking levels in the harvested area of MF 167 and prepare a map showing stocked and any unstocked areas.

Methodology

An accurate GPS map of the harvested area was prepared subsequent to the January 24th, 2009 inspection report. This map was supplied to Islands West Forestry Ltd. at a scale of 1:3255.

The Ministry of Forests and Range (MFR) silviculture survey procedures (updated 2008) were used to plan the survey and assess the stocking and plantability of the area harvested on MF 167 in 2001. A crew of two certified silviculture surveyors carried out the survey on March 1st, 2009. The crew consisted of Nancy Pezel, RPF and John Pezel, RFT.

Based on the expected stocking variability within the cutblock, a grid pattern was used to pre-determine the plot location (see map). To achieve statistical reliability 1.5 plots per hectare were



established at a 65 m interval. During the survey, plots were dropped when they landed in unharvested timber (leave tree patches) or non-productive ground (boulder patches).

The PMFLC Reg. does not specify target stocking standards, so a target of 800 trees per hectare was used (for statistical purposes only), which allows a maximum of 4 trees in a 1/50th hectare (3.99 m radius) plot. As the PMFLC Reg. requires a minimum 400 crop trees per hectare, this is the minimum stocking standard used in the survey. “Reasonably well distributed” is not defined in the Regulation, so a minimum inter-tree distance of 2.0 m was used, as this is generally the minimum defined as “well spaced” in the MFR stocking standards. The crop trees identified in the landowners’ Management Commitment are Douglas-fir (Fd) and western red cedar (Cw). Other ecologically acceptable commercial conifer and deciduous species (ie. Grand Fir (Bg), red alder (Dr) and big leaf maple (Mb)) were tallied if they were evident in the plot.

If a plot contains two or more “reasonably well distributed” crop trees that are free of pathogens, it is considered stocked. Not satisfactorily restocked plots contain less than two “reasonably well distributed” crop trees. If a seedling can be planted at a minimum inter-tree distance of 2 m from a crop tree, then the plot contains a “plantable spot”. Both stocked and non-stocked plots were assessed to determine if additional trees could be planted.

Crop tree heights and leader lengths as well as brush heights and percent cover were also recorded.

Results

A summary of the plots (attached) indicates that 3.7 ha of the surveyed cutblock is stocked with 575 well spaced trees consisting of 91% Fd and 9% Cw. The regenerating crop trees range in height from 0.25 m to 2.0 m with annual growth ranging from 15 cm to 50 cm. Based on the plot data, 18% of the Cw are browsed. Scattered leave trees and timbered reserves are evident, with the saplings averaging 4.5 m, the poles 12.0 m and the mature 25 m+. Brush consists mainly of a continuous cover of salal, averaging 0.70 m in height and 40% cover. Patches of bracken fern are also evident and average 1.15 m in height.

The silviculture label is SR Fd91Cw9-4-1.0-24/E-575(09)

The remaining 5.7 ha is not adequately restocked (ie. below the minimum even if other commercial species are included). This area contains only 212 well spaced trees consisting of 71% and 29% Cw. Although none of the Cw in the plots were browsed, browsing is evident throughout the area. Most of the Cw in the plots were small and therefore protected under the brush. The regenerating crop trees range in height from 0.17 m to 2.3 m with growth ranging 10 cm to 60 cm per year. Scattered leave trees and timbered reserves are evident throughout this area as well. The brush is variable and consists of dense patches of bracken fern 1.8 m in height and up to 90% cover, some dense patches of sword fern 0.8 m and 50% cover, and in the poorer areas salal averaging 0.6 m in height and 30% cover. Scattered maple coppices and single stems of maple are evident on the steep slopes on the east side of the cutblock and range in height from 2.5 m to 4.0 m+.



The silviculture label is NSR Fd71Cw29-5-0.8-28/E-212(09)

Observations

Stocking throughout the cutblock is variable because the Douglas-fir naturally regenerated where soil conditions, microclimate, brush levels and seed supply were most suitable to its survival and growth. In disturbed areas, such as the skid trails, where soils are exposed and brush competition was reduced, stocking is high. However, if the trails are compacted, trees often grow poorly because their roots have difficulty growing through the compacted soil and moisture has difficulty penetrating into the soil. Stocking is often higher near timber edges, where a seed supply is more regular. Although the landowner has left pole sized (7.5 cm +) and larger trees for future harvests, many of the pole sized leave trees have broken or died, limiting their use as a potential crop tree or as a seed source. Where brush competition is high, unless the crop trees were able to establish and grow quickly, the brush has completely shaded the crop trees from light (a common occurrence in dense bracken patches) or severely damaged the trees by smothering them. Dense brush also limits the exposed areas in which seeds can land to grow.

Few germinants (less than 1 year old seedlings) were observed. Throughout the cutblock only 64 germinants were tallied per hectare. None of these were selected as potential crop trees because they were only growing singly, and may not survive.

Deer browsing and possibly sheep browsing is evident on the regenerating Cw, especially when it is growing near the roads. Less browse damage was observed in dense brush.

On the east side of the cutblock, large boulders dominate the base of the slope and the small portion of the slope northeast of GPS #300. Although scattered stumps are evident in these areas, many of the western red cedar and Douglas-fir were (and are) growing on and around the boulders. The size of the boulders, air pockets between the boulders and lack of suitable planting medium make the area unplantable. This area has been netted out of the disturbed area (see map).

The main road within the cutblock averages 5 m in width. The spur roads average 4.0 m in width. These roads have also been netted out of the disturbed area.

Discussion / Recommendations

Based on the plot data, ecology, general observations made during the survey, and recommendations outlined below, the cutblock has been divided into four treatment units (see map for location of treatment units). Planting prescriptions are based on a target of 800 trees per hectare.

- Treatment Units 1 to 3 are not restocked. Fertilizer (using tea bag sized packs) is recommended at time of planting to help the crop trees reach the required 50% height above the brush by the 15th year after harvest.
- Treatment Unit 4 is currently restocked, but fill planting is recommended.



Treatment Unit 1

Salal dominates the brush layer in this treatment unit. Soils are predominantly coarse textured, moderated dry to very dry on the ridge tops, and the nutrient regime is generally poor to medium. Because planting will be difficult in the coarse textured soils, smaller plug sizes are recommended.

- Fill plant with 1+0 Fd PSB 410 stock and fertilize at time of planting.
- Plant 500 seedlings per hectare; total of 1500 seedlings.

Treatment Unit 2

Little brush is evident on the steep upper slopes on the east side of the cutblock, but becomes more prevalent towards the toe of the slope. Soils are rich and medium to coarse textured. The soil moisture regime is moderately dry and, because the steep slope is southwest facing, is expected to become drier in the summer months. Because of the steep slopes, snow creep and soil creep are also likely. Fertilizer is not required on this rich site. Deer trails are evident on this southwest facing slope. Seedlings should be planted away from deer trails, and on the downslope side of the stumps to protect them from snow/soil creep wherever possible.

- Fill plant with 1+0 Fd 412 stock.
- Plant 600 seedlings per hectare; total of 960 seedlings.
- Monitored for deer browsing and protect if necessary.

Treatment Unit 3

The lower slopes and draw within the cutblock is dominated by dense bracken and swordfern patches. Soils are finer textured and have a medium to rich soil nutrient regime and slightly dry to fresh moisture regime. Larger planting stock is recommended because it is better able to withstand vegetation damage and will grow more quickly through the brush. No fertilizer required.

- Fill plant 1+0 Fd PSB 512 with 10% Cw in lowest portion of slope.
- Plant 600 seedlings per hectare; total approx. 660 seedlings
- Use cones to protect from vegetation press and deer browsing.
- Monitor brush for manual treatment or brush around crop trees annually.

Treatment Unit 4

This area is currently stocked. However, stocking is variable and close to the minimums. Fill planting is recommended because if some trees die as a result of drought, root disease or other factors during the next 8 years, stocking could be reduced to below minimums and the area will become not stocked. Fertilization at time of planting is recommended to assist the seedlings in becoming a “successfully regenerated stand” within the 15 years post harvest.

- Fill plant 1+0 Fd PSB 410 stock
- Plant 200 seedlings per hectare; total approx. 740 seedlings





Treatment Unit 1 is poorly stocked but most established crop trees are growing well.



Better stocking is evident near the timber edges in Treatment Unit 1.





Poor stocking dominates the steep slopes of Treatment Unit 2. The skid trail is well stocked.



The boulder area with only scattered stumps has been netted out of the harvest area.





Treatment Unit 3 (middle ground) is dominated by patches of bracken fern. Treatment Unit 4 lies upslope of the skid road in the foreground.



A well stocked portion of Treatment Unit 4 near survey plot 5.



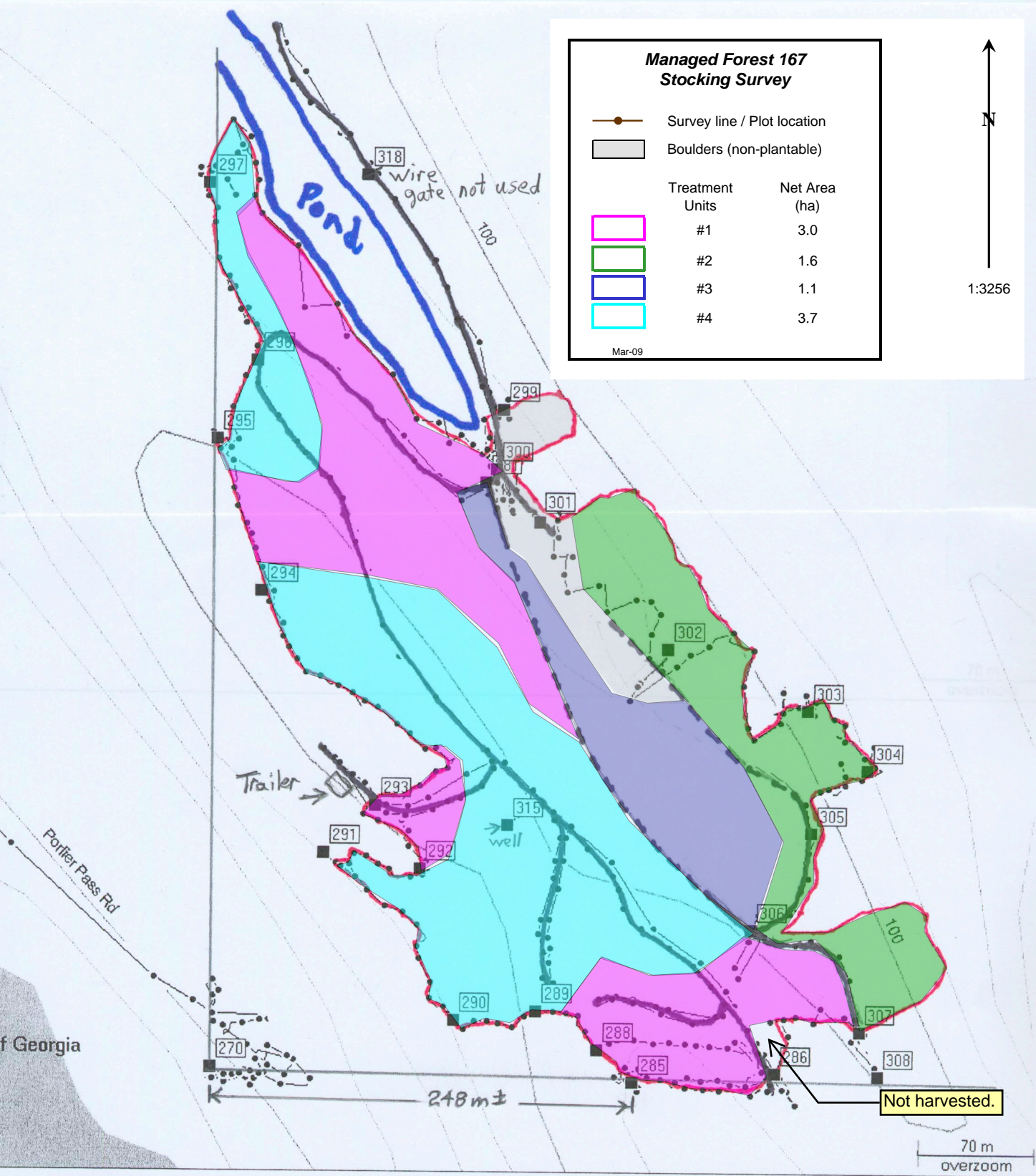
Managed Forest 167 Stocking Survey

Treatment Units	Net Area (ha)
#1	3.0
#2	1.6
#3	1.1
#4	3.7

Mar-09

↑
N
↓

1:3256



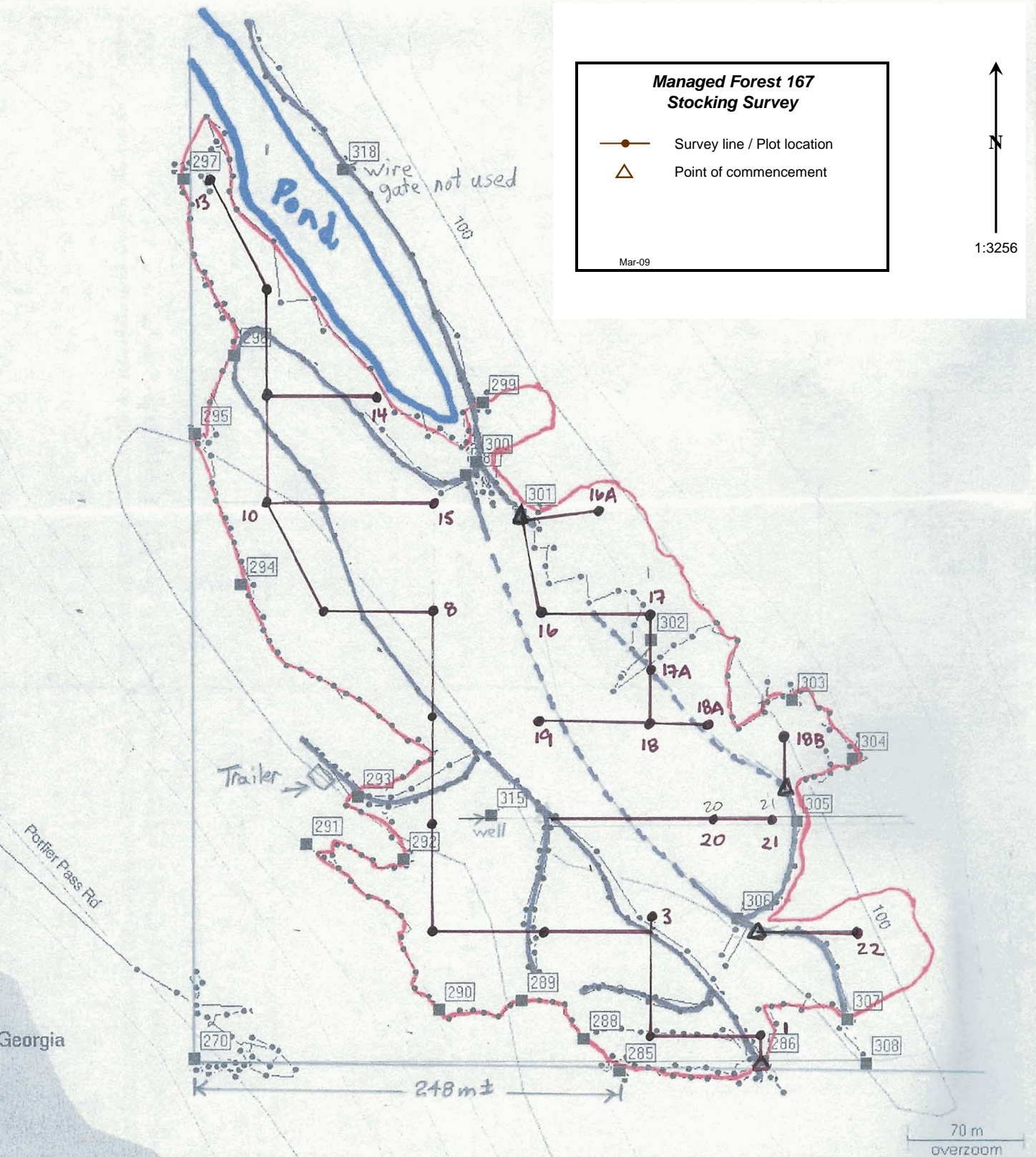
- [270] Way Point (number on flagging/double ribbon)
- Road/Skid Road surveyed by gps
- - - Skid Rd location estimated
- Harvest bdy.

Gross Area 10.6 ha

**Managed Forest 167
Stocking Survey**

- Survey line / Plot location
- △ Point of commencement

Mar-09



- [270] Way Point (number on flagging/double ribbon)
- Road / Skid Road surveyed by gps
- - - Skid Rd location estimated
- Harvest bdy. Gross Area 10.6 ha