CEDARHURST QUARRIES AND CRUSHING LIMITED
TEEDON PIT, TINY TOWNSHIP

# TREE PLANTING ASSESSMENT AND RECOMMENDATIONS

PETER HYNARD, RPF
AUGUST 24, 2013

Sue Walton, Clerk of The Corporation of the Township of Tiny do hereby certify under my hand and Corporate Seal this to be a true and correct copy of the Tree Planting Assessment & Recommendations

DATED THIS 18TH DAY OF APRIL 2018.
AT, TINY, ONTARIO

Sue Walton
Clerk


N44 39.292 W79 50.684 (Lat/Lon hddd mm.mmm' WGS 84)
Page 1 of
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W
E
S
-19.5°
Block 5
2.9 ac., 2,500 trees
Darby Rd
Block 3
3.3 ac., 3,000 trees
Block 1
1.7 ac., 1,500 trees
The Pond
Block 2
1.1 ac., not ready
Block 4
3.1 ac., 2,000 trees
984
Topo Canada v4
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Teedom Property
TREE PLANTING AREAS
GARMIN

## BLOCK 1

Block 1 is the perimeter of the man-made settling pond to the immediate northeast of the present processing operations. The net plantable area is 1.7 acres.

The soil is a heavily disturbed, deep, calcareous fine sand with a low silt and stone content. The topography consists of a short, moderate slope down to the pond on all sides. Soil drainage is generally good except on the south side where water seeps into the pond from an area of natural groundwater discharge. The site was rehabilitated after extraction by shaping the landscape and returning stockpiled topsoil to the surface. There is a light to moderate herbaceous vegetation today, mostly grasses, Queen Anne's lace and goldenrod. The soils are stable and ready to plant.

TREE PLANTING RECOMMENDATION: The goal is to establish permanent tree cover around the pond. Hand-plant with 1,500 white cedar, white spruce and white pine. The proportions should be approximately 60% white cedar, 30% white spruce and 10% white pine. Use reforestation-type bareroot stock suitable for MNR seed zone 33. For best survival, deep plant the trees so that the seedling is planted slightly deeper than the natural root collar. Space trees irregularly for a natural appearance, about 6-8 feet (1.8-2.4 m) apart and mix the species randomly. Competition is light and no site preparation is required. Assess tree survival after one and two years and refill promptly if survival is found to be less than 60%.

## BLOCK 2

Block 2 is a man-made slope from the terrace on the east side where aggregate has been stockpiled down to a still-unstable intermittent stream channel that has formed along the west side. The area is 1.1 acres in size.

The soil is a deep, calcareous fine sand with a low silt and stone content. The topography is a relatively steep, southwest-facing slope. Soil drainage is good. The slope has been shaped but considerable erosion has occurred since then. There is a light and patchy herbaceous growth in places and bare mineral soil with eroding gullies in others. The soils are still not stable at this time.

TREE PLANTING RECOMMENDATION: Do not plant with trees until the soils here have been stabilized.

## BLOCK 3

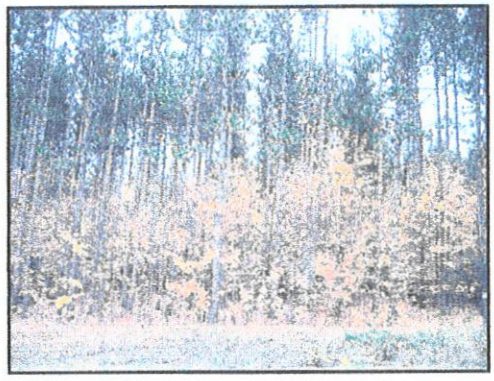
Block 3 is a previously disturbed area on which soil stabilization and rehabilitation work are complete. The block includes a small patch in the southeast corner on the opposite side of the roadway but not the pile of stockpiled topsoil which is to be removed and used elsewhere. The area available for planting is 3.3 acres.

The soil is a deep, calcareous fine sand with a low silt and stone content. The topography is gently rolling. Soil drainage is good. Herbaceous cover is light to moderate on the main block and heavy on the isolated patch in the SE corner. The present vegetation includes grasses, Queen Anne's lace, goldenrod, butter-n-eggs, clover, hawthorn, sumac, red raspberry and juniper. A small number of Scots pine have jump-started the process and begun the reforestation on their own.

TREE PLANTING RECOMMENDATION: Over the years, the method of choice for reforesting open land in Simcoe County – including heavily disturbed land – has been through the use of a red pine nurse crop. That's what is recommended here too. It's the tried-and-true method even where the long-term goal is to establish a natural self-sustaining forest.

Red pine is a hardy "pioneer" species and one that is largely pest- and problem-free. The nurse crop acts to moderate the harsh, open conditions in which later-successional species are unable to establish. On silty, well-drained sands and where there is a natural seed source nearby, hard maple, white ash and other hardwoods can be expected to invade the understory after the nurse crop has grown up. On sandy soils with a low silt content, the natural successional trend is more likely to be toward white pine and red oak if a seed source is available.

The long-term natural successional trend can be speeded up by thinning the plantation after it reaches commercial size, which is around 30-35 years. On calcareous soils like these, red pine is "off-site", which limits its natural life expectancy and helps speed the process, even where plantations are left unthinned. The last stage in the process is for associated natural ground vegetation to move back onto the site. All this is possible without further intervention, but only on suitable sites and where there is a nearby seed source. Time is an essential ingredient too. The whole process of turning an open field into a natural, self-sustaining forest requires a century or more.



**These two photos show the transition from plantation to natural forest that can occur when site conditions and seed sources are right. The plantation on the left is 35 years old and unthinned. The one on the right is 65 years and has been thinned twice. Both are on a sandy, well-drained calcareous till soil not unlike the Teedon property.**

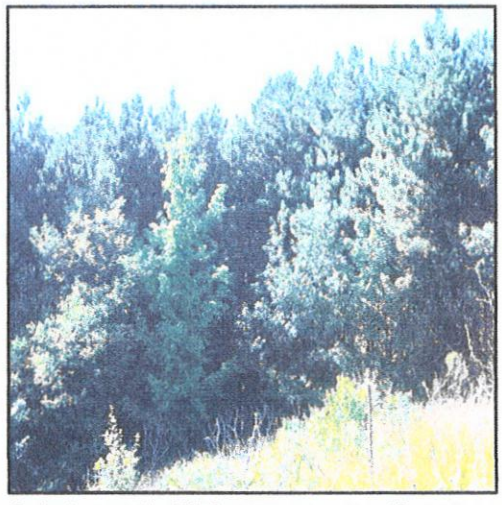
Before planting, the Scots pine that are invading Block 3 should be removed by cutting them below the lowest live branch whorl. Scots pine is a non-native, invasive species that is particularly undesirable because of its habit of spreading outside the intended area.

Block 3 has room for an estimated 3,000 trees. The proportions should be about 80% red pine, 10% white pine and 10% red oak. The trees should be deep-planted for best survival (slightly below the natural root collar) and aligned in east-west rows to facilitate future mechanized thinning operations. Rows should be spaced 7 feet (2.1 m) apart to allow room for the harvester and trees should be spaced 6 feet apart in the rows. The white pine and oak should be mixed-in randomly rather than in rows or blocks.

Competition is light in Block 3 and no site preparation is required except in the small, isolated patch in the SE corner of Block 3. There, the competition from grasses and goldenrod is strong..

The SE corner will require a chemical release after planting. Spot application of glyphosate around each planted tree is recommended and the use of a licensed pesticide applicator is required by law.[1] The planted trees will require protection from spray contact by covering them with a stovepipe or other means during spray application.

Assess tree survival after one and two years and refill promptly if survival is found to be less than 60%.



**Red pine on the Sibthorpe property adjacent to Block 3.**

[1] Pesticides Act, Sec. 5.

## BLOCK 4

Block 4 is an old field on the south side of the entrance road that was retired from agriculture decades ago. It's about 20 acres in size but the same condition spills over onto another 2½ acres on the north side of the road. The topography is gently rolling, from an elevation of about 950 feet in the southwest corner to about 850 feet down near the present weigh scale.

The soils appear to be a till of glacial origin that were later heavily water-worked during the period of post-glacial Lake Algonquin. Overall, the soils are deep, well-drained and calcareous. The surface texture ranges from a silty fine sand on the upper slope in the southwest corner to a loam and, in places, a clay loam at the lower elevations.

A considerable amount of patchy natural reforestation has occurred already. Tree cover ranges from 5% or less in the south-central part of the block to pockets of 100% or more. Tree species include feral apple, hawthorn, Scots pine, white ash and mountain ash, in about that order. Overall, about 40%-50% of Block 4 is occupied by trees today. Herbaceous vegetation and brush are moderately heavy throughout, consisting of a variable mix of grasses, goldenrod, wild strawberry, clover, milkweed, Queen Anne's lace, choke cherry, sumac, poison ivy, dogwood, wild grape and other species. This is an early successional stage and no natural successional trend has emerged so far.

Block 4 is remarkably productive as a food supply for wildlife in the form of apples, cherries, grape, mountain ash berries, raspberry, black berry, wild strawberry, hawthorn "haws" and clover.

**Block 4, clockwise from top left: a bumper apple crop, wild grapes, mountain ash and hawthorns.**

TREE PLANTING RECOMMENDATIONS: Block 4 is not in a plantable condition because of the high occupancy rate of tree cover already. To convert Block 4 to a tree plantation in the usual sense would require heavy site preparation to remove the existing tree cover first. Instead, the recommendation is to retain Block 4 as a wildlife food supply area, slow the infiltration of Scots pine within it and establish two small patches of conifer cover to complement it as wildlife habitat.

The Scots pine should be rogued from Block 4 first wherever it is invading areas dominated by apple and hawthorn, and in the two patches to be planted. Leaving the Scots pine untouched would eventually end in the Scots pine outgrowing the apple and shading it out. There is, however, little to be gained in attempting to eliminate the Scots pine in those patches where it is already dominant, and patches like that may be by-passed. Scots pine is already entrenched on the property and in Simcoe County, and attempting to rid Block 4 completely will do little to change that.

**Block 4: The Scots pine should be removed in these two situations: on the left, where it is invading an area of apples, and on the right, where it is establishing on the area to be planted.**

Hand plant the two patches shown on the accompanying satellite image with 2,800 eastern red cedar, white cedar, white pine and red oak. The goal is to add conifer cover for wildlife purposes, to complement the abundant food supply already present. The proportions should be approximately 50% red cedar, 30% white cedar, 10% white pine and 10% red oak.[2]

Space trees irregularly for a natural appearance about 6-8 feet (1.8-2.4 m) apart and mix the species randomly. Plant around any existing apple and hawthorn and leave the existing roadway open. For best survival, use a deep-planting method in which the tree is planted slightly deeper than the natural root collar. Grass competition ranges from moderate to heavy and chemical release may be required. Assess tree survival after one and two years and refill promptly if survival is found to be less than 60%.

## BLOCK 5

Block 5 is the 2.9 acres of open field along Darby Road. It has been mowed, electrically fenced and is in current use as a horse paddock by the tenant, which is the neighbouring horse farm across the road.

The soil is a deep, well-drained, calcareous, silty, very fine sand. Block 5 is suited to a broad assortment of reforestation tree species, including red pine, white pine, white spruce, Norway spruce, white cedar, red cedar and red oak. Hay had been cropped off the field shortly before assessment.

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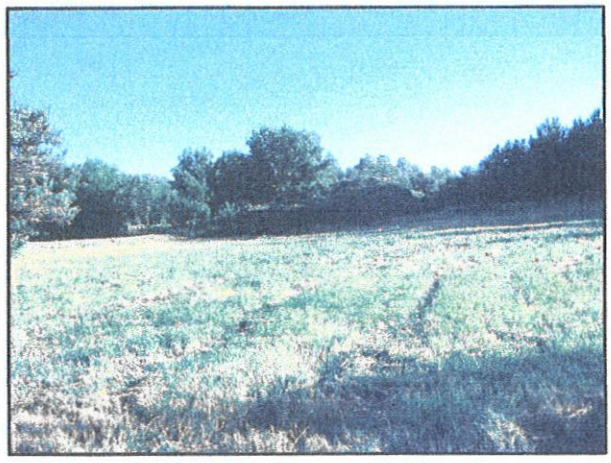
[2] One natural red cedar was found in Block 4, along the southern fence line, at UTM 17T 0592004 4944620.

RECOMMENDATION: The front field does not require rehabilitation and tree cover is not necessarily the best land use in this case. Some thought should be given to leaving the front field in agricultural use as long as the demand exists.



Block 5 should be planted, though, once grazing and mowing have come to an end. Field abandonment in this case will result in an invasion of Scots pine, as has occurred elsewhere on the property. Without annual mowing, it's just a question of time.

Block 5 may be planted using the same species and methods described for Block 3 except that row planting will not be possible in the southwest corner. The total number of trees required is 2,500. Grass competition is very strong and herbicide treatment is recommended before planting.

## THE ISSUE OF COMPETITION CONTROL AND HERBICIDE USE

It is a well-known fact that heavy competition for moisture, nutrients, light and space from herbaceous and woody vegetation can result in low seedling survival and plantation failure. This is less of a factor on heavily disturbed and low-competition sites but it can be a significant factor on fertile and otherwise competition-prone sites.

Re-fill planting can restore plantation success if the original problem was stock quality, tree-planting quality or weather but if the problem was competition, the re-filled trees will face the same problem the second time around.

On old-field sites in southern Ontario, herbicides are the most cost-effective method of controlling competition during the short period of seedling establishment. Ontario's *Pesticides Act* requires that only licensed pesticide applicators may be hired for this purpose and only herbicides registered for this use may be employed. For the most part, these are the same chemicals that are in annual usage on the surrounding farmlands.

Herbicides can be applied before planting using a tractor and boom sprayer (which is safer for the planted trees, and cheaper), or after planting using a backpack or ATV-mounted hose and nozzle sprayer (which uses less chemical). When boom spraying, the strips must be laid out with the tree planting in mind and marked in some way so as to be obvious to the tree planters later. When spot spraying after planting, the trees must be protected from direct contact and drift in some way, such as with a temporary stovepipe cover.

If the landowner has a no-herbicide policy, the planting can be still be done but survival and growth will be less and expectations should be lower.

For more information on competition control and the alternatives to herbicides, go to the Ministry of Natural Resources website at http://www.lrconline.com/Extension_Notes_English/pdf/rm_grw.pdf.

## SUMMARY OF NURSERY STOCK REQUIREMENTS

| BLOCK NUMBER | AREA | RED PINE | WHITE CEDAR | EASTERN RED CEDAR | WHITE PINE | RED OAK | WHITE SPRUCE | TOTALS |
|---|---|---|---|---|---|---|---|---|
| 1 | 1.7 ac. | | 900 | | 150 | | 450 | 1,500 |
| 3 | 3.3 ac. | 2,400 | | | 300 | 300 | | 3,000 |
| 4 | 3.1 ac. | | 800 | 1,400 | 300 | 300 | | 2,800 |
| 5 | 2.9 ac. | 2,000 | | | 250 | 250 | | 2,500 |
| **Totals** | **11.0 ac.** | **4,400** | **1,700** | **1,400** | **1,000** | **850** | **450** | **10,700** |

## HOW TO LOCATE A SUITABLE NURSERY AND TREE PLANTING CONTRACTOR

Several nurseries in southern Ontario supply bareroot reforestation-type stock of the type described in this report. The closest is Somerville Nurseries near Alliston (http://www.treeseedlings.com). For a complete list of nurseries and tree planting contractors, visit Trees Ontario at http://www.treesontario.ca/partners/index.php/agencies_partners and follow the links.

Your tree order should be placed in the fall before shortages occur. When placing your order, be sure to ask for stock of a seed source suited to MNR seed zone 33.

You should hire an experienced tree planting contractor and provide him or her with a copy of this report. The Trees Ontario website contains a listing of tree planting contractors as well.

The bareroot planting season begins in the spring as soon as the frost is out of the ground in April and ends when tree growth begins in May. The best time is usually the last week of April and the first week of May. Your contractor can pick up and store the trees prior to planting as part of the arrangement.

Peter Hynard, RPF
August 24, 2013