

**Tree Inventory and Preservation Plan
Thornbury Acres
Concession 8, Grey Road 40**

**Report Prepared for:
Thornbury Acres Holdings Inc.,**

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Acronyms and Abbreviations

CUM	Cultural Meadow
CUT	Cultural Thicket
CUW	Cultural Woodland
DBH	Diameter (of a tree) at breast height
EIS	Environmental Impact Study
ELC	Ecological Land Classification
EAB	Emerald Ash Borer
ELC	Ecological Land Classification
FCSP	Farm Co-operative Site Plan
FOD	Deciduous Forest
SAR	Species at Risk
SOCC	Species of Conservation Concern
TIPP	Tree Inventory and Preservation Plan
TOBM	Town of Blue Mountains

1.0 INTRODUCTION

1.1 Background and Purpose

Plans are currently being advanced for the development of a 60-hectare (ha) area of land located on the southeast corner of the intersection of Grey Road 40 and Grey Road 2 in the Town of the Blue Mountains (TOBM). The land consists of three adjoining 20-acre parcels, all currently held by Thornbury Acres Holdings Inc.. The land is referred to herein collectively as the "Thornbury Acres Property", the "TA Property", or simply the "Property".

A Farm Co-operative Site Plan (FCSP) has been proposed for the TA Property. A copy of that plan is attached hereto as Appendix A. In pre-consultation discussions, the TOBM has requested a Tree Inventory and Preservation Plan (TIPP) as a component of submissions in support of pending applications for the TA Property.

This report has been prepared to meet the need for a TIPP as a supporting document in the planning process for the Property. The overall purpose of this TIPP is to facilitate post-development tree presence that will effectively meet functional objectives of relevance to the planning and approval process.

1.2 Approach

The overall objective of this VPP is to facilitate post-development vegetation presence that will effectively meet functional objectives of relevance to the planning and approval process. The approach and scope of this VPP have been developed in consideration of similar plans completed at other sites of similar development scope within the TOBM (e.g. Morris, 2012 and 2021) and also in consideration of available general guidance (e.g. NEC, 2022). To serve the noted purpose, the preparation of this TIPP has followed four main steps:

1. Inventory and characterization of existing tree cover and relevant conditions within the TA Property (Section 2);
2. Identification of tree preservation opportunities and priorities (Section 3);
3. Assessment of the implications of the proposed FCSP on the existing tree cover, in consideration of the identified opportunities and priorities (Section 3); and
4. Identification of recommendations and measures to achieve post-development objectives pertaining to tree presence under the FCSP (Section 4).

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The approach and scope of this TIPP have been developed in consideration of TIPPs completed at other sites within or near the TOBM (e.g. Morris, 2012 and 2021) and also in consideration of available general guidance (e.g. NEC, 2022).

In general, this TIPP also expands upon relevant findings and recommendations of the Environmental Impact Study (EIS) (Morris, 2022) that was recently submitted in support of the planning and approval process. Overall, the EIS concludes that the proposed development at the TA Property meets policy requirements and there is no expectation of any negative impacts on the specific features of interest (Significant Woodlands SAR, SWH, watercourses) or the Natural Heritage System (NHS) that they comprise. Notwithstanding an absence of impacts, the EIS provides the following recommendations:

- The Property should be developed so as to minimize the loss of any tree cover within the Property, with highest priority given to locations adjacent to the areas of Significant Woodlands;
- A TIPP should be prepared and implemented which retains and protects existing trees to the extent practical during the construction period, and which establishes post-construction planting objectives for the initial stages of development (clearing, grading, installation of access and service infrastructure) and for the eventual development of individual homesteads;
- Optimize the size or configuration of homesteads to allow maximum retention of existing trees on lot perimeters, if possible given engineering requirements;
- Establish requirements for post-construction tree planting where retention of existing trees has low feasibility, with a focus on ecologically oriented planting; and
- Areas of retained or replaced tree cover should be planned and managed so as to maintain natural characteristics to the extent possible. This is most important in areas adjacent to the FOD8 community in Parcel 1 and the CUW community in Parcel 2.

This TIPP reflects and expands upon these recommendations. It should also be noted that the FCSP itself has been developed in consideration of the findings and recommendations of the EIS, which confers an inherent level of retention and protection of existing vegetation that is considered to be of relatively high priority as a component of the NHS.

2.0 TREE INVENTORY AND SITE ASSESSMENT

The current inventory of tree presence within the Property reflects relatively high level delineation and characterization of woody vegetation within the Property. This level of site characterization supports the subsequent steps of this TIPP in a manner that is appropriate for this stage of development planning and approval. Detailed surveillance of individual trees throughout the Property has not been completed at this stage, with the exception of Butternut specimens (see Section 2.4). Recommendations for individual tree survey at later stages of development and approval are provided in Section 4.

For this TIPP, the assessment of tree presence within the Property is based primarily on the findings of the EIS (Morris, 2022) that has recently been prepared in support of the planning and approval process. On-site examination of the Property for the EIS was completed over the period of 2020 to 2022, and included Ecological Land Classification (ELC) and focused assessment of key characteristics of wooded communities. Elements of the ELC characterization included:

- Relative species composition and percent cover of trees and shrubs,
- Forest stand and canopy characteristics (e.g. structural layering, canopy closure)
- Caliper and height range of trees in wooded units, and
- General under-storey characteristics and non-woody ground cover composition.

The detailed ELC monitoring also included examination of physiographic attributes that can be determinants of existing tree presence, and also possible determinants of post-development TIPP objectives. This includes topography/slope, surface soil profiles, and the possible presence of elevated water table.

The site surveillance completed for the EIS also included focused surveillance for the presence of any tree Species at Risk (SAR) or Species of Conservation Concern (SOCC).

Additional assessment of the Property in specific context of this TIPP was conducted in August of 2022, providing information pertaining to the location and characteristics of trees not necessarily captured within the EIS scope. This included an assessment of the presence and characteristics of tree-lines or individual tree specimens, and additional detail regarding the nature of woody vegetation within specific communities and/or in specific areas of development (i.e., individual lots or blocks).

The findings of direct surveillance of relevance to the TIPP are summarized in the following sections. It is noted that the EIS was completed with enhanced focus on areas designated as Significant Woodland, which have been identified as priorities for protection and preservation in this TIPP. For various reasons, the EIS also differentiates between two parcels within the Property, and EIS findings have been documented with reference to these parcels. For consistency, this TIPP document also differentiates

between the two parcels of reference in the EIS. The parcels and the areas of the Significant Woodlands are illustrated in Figure 1.

2.1 Physiographic Characteristics

The TA Property is characterized by generally level topography with an overall average slope of about 1%, generally to the north. There are scattered small pockets of very minor elevation or depression within the Property, but there are no larger scale topographic variations that have significant influence on vegetation.

According to the Grey County soil survey (Gillespie and Richards, 1954), the overburden within the TA Property is classed mainly as Warton Loam. This is a medium-textured calcareous soil with clay inclusions that exhibits imperfect drainage. There is also a pocket of Brookston Clay Loam in the southwest corner of the Property which has finer texture and is reported to have limited drainage. In general, both of these soil types can lead to wet conditions at or near soil surface.

The generally level topography and imperfect drainage throughout the Property are key factors that influence the nature of the vegetation community types currently found. These same conditions are considered in the development of tree preservation objectives and recommendations herein.

2.2 Existing Vegetation Communities

Presently, about 90% of the TA Property is occupied by vegetation communities that are primarily woody (trees and/or shrubs) and largely influenced by the land management history of the Property. These woody communities are mainly deciduous and comprised largely of shrubs and young trees that are typical of early succession lands in the region. ***Mature forest communities or late-succession communities typical of the region are not found within or immediately adjacent to the Property.*** The generally level topography and imperfect drainage conditions throughout the Property are also key factors that influence the nature of the vegetation community types currently found.

Following the ELC system of Lee *et al.* (1998), the early succession communities within the Property include Cultural Thickets (CUT) and Cultural Woodlands (CUW) that account for a bit more than 80% (~50 ha) of the Property. About 6 ha (~10%) of the Property is currently occupied by Cultural Meadow (CUM) communities, largely in the form of active crop lands. Aside from the prevailing Cultural communities, there is a single 5-ha patch of Deciduous Forest (FOD) community in Parcel 1. This deciduous forest patch has been mapped as *Significant Woodland* in the Grey County OP. About 7 ha of the CUW community in Parcel 2 is also mapped as *Significant Woodlands*. The presence of *Significant Woodlands* within the Property is illustrated in Figure 1. Figure 2 depicts the ELC communities that are referenced herein. Table 1 provides a summary of tree presence for each community of reference. Each community is described below, including tree cover characteristics that are considered in the TIPP context.

2.2.1 Cultural Thicket

Over the majority of Parcel 1 and about a quarter of Parcel 2, shrubs and young trees have become established as part of the early succession process, but the presence of trees remains below the threshold for classification as "Woodland". The total average tree cover is estimated as <25%, and there is a general absence of mature trees or any continuous canopy. Under the ELC system, this is classed as a Cultural Thicket (CUT) community type.

Saplings of White Ash are the dominant constituents of the woody cover within this community. Scattered young White Elm, Eastern White Cedar and Red Ash are also present. Nearly all tree specimens are <10 cm diameter at breast height (DBH) and <5 m tall, with the majority being <5 cm DBH and <3 m tall. Trees measuring 15 cm DBH are effectively absent.

The CUT community within the Property represents early stages of regeneration, and is likely to progress to a Mineral Ash Lowland Deciduous Forest (FOD7-2) community in the coming decades.

2.2.2 Cultural Woodland

In parts of Parcel 1, most notably on the north and west perimeter, clusters of young conifers have established with tree cover now in the range of 30 to 50 %. The tree cover is mainly coniferous and comprised of variable presence of Eastern White Cedar, Red Pine, White Spruce, and also Scot's Pine. The trees are relatively young and even aged, with the largest specimens reaching 25 cm DBH. Two small patches on the west side of Parcel 1 appear to have been planted, and could be described as Conifer Plantation (CUP3) under the ELC system. The combined area of these coniferous woodland patches in Parcel 1 is just over 3 ha, and individual patch sizes range from about 0.2 to 1 ha.

Moving south from the CUT community in Parcel 2, there is an abrupt transition in the nature of woody vegetation commencing at an old stone fence-line that traverses the parcel on an east-west axis. From this line to the southern Property boundary, trees are more abundant and generally larger than those in the adjacent CUT community. Within this 8-ha block, total woody cover exceeds 75%, but much of this consists of shrubs. The overall average tree cover in this area is estimated as no more than 50%. Similar to the CUT community to the north, White Ash is the dominant tree species, with a secondary and scattered presence of White Elm, Eastern White Cedar and also Trembling Aspen. The majority of trees are relatively young and measure <15 cm DBH. However, there are a few small (<0.25 ha) clusters of relatively mature Cedar or Aspen where specimens in the range of 20 to 45 cm DBH are locally prevalent. Outside of the noted clusters, the canopy is relatively thin and incomplete and there is no discernable canopy layering. There is a dense presence of shrubs throughout this CUW community. Red-osier Dogwood is a primary constituent of the shrub layer, along with non-native European Buckthorn which forms dense stands throughout.

2.2.3 Deciduous Forest

The area mapped as Significant Woodland in Parcel 1 is the only portion of the Property where tree cover is substantial enough to warrant designation as a "forest" community. The canopy of this forest block is heavily dominated by Trembling Aspen, and is consistent with the Fresh-Moist Poplar Deciduous Forest (FOD8-1) under the ELC system. The Aspens exhibit a relatively narrow range of age-size classes. Most canopy specimens are in the range of 15 to 30 cm DBH, with a moderate presence of specimens in the range 30 to 45 cm DBH. In addition to the dominant presence of Trembling Aspen, there are limited pockets where Balsam Poplar are relatively abundant in the canopy, generally in the same size class as the Aspen. White Ash are also present in relatively low abundance and primarily as a sub-canopy constituent. The subcanopy is not well developed, but there is a fairly well established shrub layer. Non-native Buckthorn is a dominant component of the shrub layer, forming relatively dense stands in many parts.

2.2.4 Other Treed Features

In addition to the ELC communities that have been delineated within the Property, there are several tree-lines within the TA Property that are identified for the purpose of this TIPP. These tree-lines are depicted in Figure 2, and include the following:

- an east-west line of planted Norway Spruce (non-native) traversing the CUW community in Parcel 2, mostly measuring 25 to 45 cm DBH.
- two north-south tree-line segments along the boundary of Parcels 1 and 2, comprised of Norway Spruce, mostly measuring 25 to 45 cm DBH.
- a primarily deciduous tree-line along most of the eastern boundary of Parcel 2, composed of a mix of native and non-native trees and shrubs. This line includes multiple specimens of Butternut, along with specimens of Ash, Basswood and a few Sugar Maple.
- a north-south deciduous tree-line through the centre of Parcel 2, traversing CUM and CUT communities. This line includes multiple specimens of Butternut, as well as Ash and Elm.
- an east-west deciduous tree-line through the centre of Parcel 2, separating CUT and CUM communities. This line includes multiple specimens of Butternut, as well as Ash and Elm.

2.3 Woody Plant Species

A total of 42 woody species (trees and shrubs), including seven conifers, have been identified within the Property (see Table 2). This includes 11 species that are non-native. There are only a few tree species that occur in high abundance and wide distribution

within the Property. White Ash and Trembling Aspen have a greater presence within the Property than all other tree species. Eastern White Cedar also exhibit relative abundance, found primarily in dense clusters in the north half of Parcel 1 and the south half of Parcel 2. Regional climax tree species (American Beech, Sugar Maple, Eastern Hemlock, Ironwood) are either absent or occur in very limited abundance and distribution within the Property. Overall, woody and non-woody species typically encountered in late-succession forests within the region are not meaningfully present within the Thornbury Acres Property. Red-osier Dogwood is the most abundant and widespread shrub species within the Property. This species is typical of early succession communities and/or relatively moist soil conditions.

A few woody hydrophilic species (Eastern White Cedar, Red Ash, Red-osier Dogwood) are abundant and widely encountered within the Property, reflecting the generally moist soil conditions that prevail. These species are also regularly encountered in early succession communities even where conditions are relatively dry. Their presence throughout the TA Property is likely reflective of both soil conditions and the general prevalence of early succession plant communities.

2.4 SAR and SOCC

The Tree Inventory has included focused assessment of the presence of tree species that are Species at Risk (SAR) under legislation, or are otherwise considered to be Species of Conservation Concern (SOCC). The term SAR is applied to those included in regulatory listings as *Threatened* or *Endangered*, and thus subject to certain regulatory prohibitions. The term SOCC is generally applied to species other than those legally designated as *Threatened* and *Endangered*, and includes those designated as Special Concern, or with a conservation status rank (SRank) of S1, S2, S3 or SH, or otherwise considered rare in Ontario.

In specific regard to trees, the candidate SOCC and SAR that are known to be present in the region are Butternut, designated as *Endangered* in Ontario, and Black Ash, also designated as *Endangered* but with regulatory prohibitions temporarily paused until 2024.

Black Ash prefer relatively wet soil conditions and are generally confined to forested wetlands or lowland forests. While the Property does provide conditions that could support this species to some extent in limited areas, **direct on-site surveillance has not revealed the presence of any Black Ash specimens within the Property.**

Butternuts can grow in a variety of habitats with relatively well-drained soil, often in association with slopes and wooded stream valleys. The preferred conditions for this species are generally absent from the Property. However, through direct on-site surveillance, a total of 55 Butternut specimens have been identified within the TA Property, all within Parcel 2. All specimens were located along or closely adjacent to remnant stone fence-lines that bisect or border the north half of Parcel 2 (see Figure 3). This may reflect the fact that the fence-lines are raised and provide a well drained rooting

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zone. The larger and relatively mature specimens were generally located along the centre of the fence-line or on its immediate edges, suggesting that at least some may have been planted. These specimens are mostly in the range of 15 to 30 cm DBH, with 12 specimens exceeding 30 cm DBH. The observed Butternut specimens include 12 saplings (i.e.; with a DBH <5 cm), mostly located within 10 m of the fence-lines. A single sapling was detected within the CUT community about 40 m from the east property boundary. Aside from this one sapling, no other Butternuts were observed in this area or otherwise further than 10 m from the fence-lines. A formal Butternut Health Assessment (BHA) was not completed as part of the accompanying EIS. Based on cursory examination, all trees would likely be classed as Category 2 (i.e., retainable) under the BHA protocol. In absence of any nearby trees with obvious canker, the specimens observed within the TA property would not be classed as Category 3 (i.e., archivable).

The presence of Butternuts is a key factor in the identification of tree protection priorities for the Thornbury Acres property.

3.0 PRESERVATION OPPORTUNITIES AND PRIORITIES

The following analysis includes an overview of the general opportunities for retention of existing woody vegetation, and a review of more specific considerations that guide preservation, protection or mitigation efforts for the various elements that comprise the FCSP (see Section 4). The analysis considers the results of the tree inventory and site characterization, along with the nature and location of various aspects of development, as depicted in the FCSP (see Appendix A).

3.1 General Considerations

The nature of existing tree presence within the Property, as documented in Section 2, has been used to identify and relatively rank opportunities for meaningful retention of trees within the TA Property. The recommendations presented in Section 4 reflect these opportunities and priorities in a comprehensive manner. The merit of preservation or replacement of any individual tree or block of woody vegetation in part considers the overall objective of ensuring a long-term and site-wide presence of trees that perpetuates and augments ecological and other functional benefits associated with trees that are currently present.

The identification and prioritization of tree preservation opportunities herein is based on several factors of relevance to the various functional objectives that underlie this TIPP. This includes the following:

- **Size/Maturity** - A size threshold of ≥ 15 cm DBH is applied as a criterion for inclusion as priority candidates for preservation. This is a widely applied size threshold for tree protection purposes, relating to forest maturity and structure as well as individual tree functions (e.g. shading, urban canopy contributions). The presence of trees ≥ 15 cm DBH generally confers a relatively high priority for protection and preservation.
- **Viability**: Long-term planning for tree presence should consider various factors that may affect survivorship rates of any trees retained. For current purposes, Ash are not considered to be viable or retainable due to the spread of Emerald Ash Borer (EAB). White Elm is also excluded as a candidate for long-term retention due to the effects of Dutch Elm disease. Trembling Aspen is also recognized as a pioneer species that typically comprises communities in earlier stages of succession, and stands of this species tend to be transitional. Species with an expectation of limited long-term persistence are generally given relatively low priority for protection and preservation, especially as primary constituents for forest stands (as opposed to individual trees).
- **Native Status**: Non-native species are generally not included as trees that would warrant retention, although retention of mature specimens can be considered

where their location confers certain functional or aesthetic benefits. Non-native species are generally assigned Low Priority or entirely excluded from tree preservation plans.

The identification of instances where tree preservation may be warranted and prioritized also considers potential implications with respect to local ecology, public viewscape benefits, and private owner benefits (landscaping, aesthetics, privacy).

3.2 Findings for the TA Property

For each specific area considered, the tree preservation opportunities and priorities are *relatively* assessed. The relative prioritization herein also reflects the main findings and recommendations of the recently prepared EIS. *A key recommendation of the EIS is to develop a Tree Preservation Plan (TPP) for the Property, with a focus on protection of Significant Woodland areas and Butternuts.*

The Tree Inventory completed for the Thornbury Acres Property has identified several distinct vegetation units or treed features that warrant consideration in the TIPP. Figure 2 illustrates the distribution of vegetation units within the Property, and certain key features (tree-lines, Aspen Forest) are also identified in the FCSP (Appendix A). The main characteristics and assigned priority for each community or identified treed feature are as follows:

- **Cultural Thicket** - almost all trees <15 cm DBH and dominated by Ash (susceptible to EAB). This community confers effectively no meaningful opportunities for tree preservation, and is designated as **Low Priority**.
- **Cultural Woodland (CUW) in Parcel 1** - presence of native and non-native coniferous trees >15 cm DBH in moderate abundance. This community is conservatively designated as **Medium Priority**, and with emphasis on locations of potential view-scape benefits and with high presence of native species.
- **Cultural Woodland (CUW) in Parcel 2** - presence of native deciduous and coniferous trees >15 cm DBH in moderate abundance, mainly as clusters of Trembling Aspen or Eastern White Cedar. This community is designated as **Medium Priority**, partly in consideration of the Significant Woodland designation and with emphasis on clusters of Aspen and Cedar.
- **Deciduous Forest (FOD)** - this is the only woody vegetation community with pervasive presence of native trees (primarily Trembling Aspen) measuring well above >15 cm DBH and with discernable forest structure development. Partly in consideration of the Significant Woodland designation, this forest block is ranked as a relatively **High Priority**.
- **Norway Spruce Tree-Lines** - the lines of Norway Spruce that traverse or border Parcel 2 are designated as **Low Priority**. The trees are non-native but are large and may serve non-ecological objectives (view-scape, wind-break). The east-

west line in Parcel 2 is least likely to provide such function, and is the lowest priority for preservation.

- **Deciduous tree-lines** - the tree-lines that traverse or border the north half of Parcel 2 include a mix of non-native and native species, with only a few specimens that exceed 15 cm DBH and which have relatively high-likelihood of long-term viability. However, these tree-lines include multiple butternut specimens which warrants a designation as **High Priority**. In absence of the Butternuts, the tree-lines that border the Property or would occupy the perimeter of proposed residential lots would be considered Medium Priority for preservation in their existing state, mainly from a non-ecological perspective.

4.0 IMPACTS OF DEVELOPMENT

The following assessment of development implications addresses the various major elements and areas of proposed development, as delineated in the proposed FCSP (Appendix A). It should be noted that the proposed FCSP has been developed in consideration of the findings and recommendations of the EIS. The EIS has determined that the presence of woody vegetation within the Property is generally supportive of limited ecological function. Accordingly, ***the EIS generally concludes that loss or alteration of some portion of existing wooded areas, including Significant Woodlands, could occur without significant impacts. That conclusion is conditional upon mitigation measures specified in the EIS.***

The analysis that follows does acknowledge aspects of the FCSP that follow certain EIS recommendations, but does not initially assume the implementation of other mitigation measures. The recommendations regarding mitigation measures, provided in Section 5 of this TIPP, expand upon the results of this initial analysis.

4.1 Servicing and Infrastructure

Prior to the development of homesteads, some construction of supporting infrastructure will be completed. This includes rough grading, the installation of roadways, the installation of utilities corridors, and the implementation of stormwater management measures. Impacts associated with these initial construction efforts may be direct or indirect, and acute or chronic. In general, impacts may occur due to:

- Intentional removal of trees within the defined limit of disturbance associated with a given construction effort;
- Accidental contact and damage of trunks or limbs of trees that are immediately outside the limit of disturbance during the operation of construction machinery;
- Damage to the roots of trees (inside or immediately outside of the limit of disturbance) during excavation within the limit of disturbance;
- Impairment of root function of trees located inside or immediately outside of the limit of disturbance, as a result of compaction within the limit of disturbance;
- Impairment of root function of trees (inside or immediately outside of the limit of disturbance) as a result of altered runoff or infiltration patterns (due to grading or ditching) within the limit of disturbance; and
- Impairment of root function of trees (inside or immediately outside of the limit of disturbance) as a result of placement of impermeable surface within the limit of disturbance.

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The likelihood and significance of any of the potential impacts listed above is dependent on the specific nature of the construction activity as well as the nature of the woody vegetation and the soil conditions at the site in question. These factors are considered in the following assessment of various elements of infrastructure for the TA Property development.

Roads:

The FCSP identifies about 2.2 km of road to facilitate access to the residential portion of the Property. The total area occupied by the 20-m wide road bed is about 4.4 ha. The majority of this area lies within the Low Priority CUT community in Parcel 1. About 1.5 ha of road overlaps the Medium Priority CUW community, mostly in Parcel 2, and 0.1 ha is located in the southern end of the High Priority FOD community in Parcel 1.

The installation of roads within each of these areas will result in direct loss of existing woody vegetation within the limit of disturbance, and will also pose some risk of indirect impacts on trees along the immediate perimeter of the area of disturbance.

Stormwater Management

The FCSP identifies an SWM pond in the northeast corner of the Property. This area is currently occupied by cultivated agricultural land and will remain in agricultural use. The Pond does not overlap any treed areas, but is immediately adjacent to a High Priority deciduous tree-line where Butternuts are located.

There is no anticipation of large scale pre-construction site grading for drainage or SWM purposes. Local minor grading within the defined homesteads will largely serve to meet SWM objectives. The naturalized buffers for each homestead will facilitate local stormwater conveyance, and clearance of existing vegetation within these buffers is not anticipated.

Overall, site alterations relating to drainage and SWM are not expected to result in meaningful loss or harm of Medium or High Priority communities within the Property.

4.2 Homesteads

In general, development of the homesteads may have adverse impacts (direct or indirect, and acute or chronic) on existing vegetation due to:

- Removal of trees within the building envelope for purposes of grading, or construction of buildings and infrastructure (e.g. driveways, patios, pools);
- Accidental contact and damage of trees (inside or immediately outside of the building envelope) during the operation of construction machinery within the building envelope;

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- Root damage to trees (inside or immediately outside of the building envelope) during excavation within the building envelope;
- Impairment to root function of trees (inside or immediately outside of the building envelope) as a result of compaction within the building envelope;
- Impairment to root function of trees (inside or immediately outside of the building envelope) as a result of altered runoff patterns due to alterations (grading, ditching) within the building envelope; and
- Impairment to root function of trees (inside or immediately outside of the building envelope) as a result of placement of impermeable surface within the building envelope.

This assessment of potential impacts of homestead development on existing woody vegetation considers all of the potential impacts identified above. The assessment considers existing conditions without any mitigation measures. It also takes into consideration, on a site-specific basis, the following factors:

- The nature of existing tree specimens within and around each homestead,
- The nature of soils,
- The presence of adjacent natural features (streams, natural areas), and
- The location of the homestead in regard to possible view-scape function.

The FCSP identifies a total of 27 homesteads distributed over Parcel 1, and 10 additional homesteads in the south half of Parcel 2. Each homestead measures about 0.5 ha, and the total area allocated to this use in the FCSP is about 20 ha.

In Parcel 1, the homesteads are located largely within the CUT community. A few homesteads in the northwest corner of Parcel 1 overlap small patches of coniferous CUW, and several homesteads are situated on the immediate periphery of the FOD community. In Parcel 2, the homesteads are situated within the CUW community, and overlap some patches of relatively large Trembling Aspen and Eastern White Cedar.

Eventual development will unavoidably result in loss of existing natural vegetation within the cleared portion of each homestead. The proposed FCSP identifies a 10-m wide natural buffer on the side and rear perimeter of each homestead, which provides opportunities for a level of retention of existing vegetation. Homestead development also has potential for indirect impacts on retained trees within and adjacent to the building envelopes, primarily through root zone disturbance and also from inadvertent contact during clearance of construction.

Table 4 summarizes the vegetation communities encountered within the residential lots, and the general implications in the VPP context. The homestead reference numbers are as assigned in FCSP. Overall, the primary implication is the presence of relatively High

Priority trees (FOD and tree-lines with Butternuts) along the outer margins of 12 of the 37 proposed homesteads. There are an additional 9 homesteads which overlap CUW communities which are designated as Medium Priority for tree preservation.

For the remaining 16 homesteads (all in Parcel 1), any direct or indirect impacts will affect only Low Priority vegetation communities. Accordingly, the assessment of impacts and the development of preservation or mitigation recommendations gives no further focused consideration to these lots.

4.3 Agricultural Lands

The FCSP identifies a total of about 21 ha of land designated for mixed agricultural use, occupying the north ends of Parcels 1 and 2. The agricultural lands overlap the following vegetation communities or features:

- ~ 6 ha of land in Parcel 2 already cleared for agricultural use, and tile drained;
- a few patches of CUW, totaling about 2 ha, in the north end of Parcel 1;
- about 13 ha of CUT habitat within Parcels 1 and 2;
- Norway spruce tree-lines on the boundary of Parcels 1 and 2; and
- deciduous tree-lines in the north half of Parcel 2 (centre and east perimeter), that include Butternut specimens.

The FCSP calls for retention of all existing tree-lines and also any Butternut specimens associated with the deciduous tree-lines. Agricultural land-use is depicted as bordering these tree-lines, and there is theoretical potential for indirect impacts of that land-use on trees within the tree-lines. Agricultural activities within or near the root zone of any Butternuts could lead to soil compaction or inadvertent exposure or damage of root systems as a result of cultivation or other activities.

Any displacement of CUW patches in Parcel 1 will result in loss of trees that are considered Medium Priority, mainly from a potential view-scape perspective. These tree losses should be a determinant of the overall post-construction planting scheme for the Property. The displacement of CUT community has minimal tree preservation implications.

4.4 Recreational Lands

The FCSP identifies a total area of about 16 ha that will serve as Recreational Lands. These lands include the ~5-ha block of FOD in Parcel 1 that is identified as Significant Woodland. Recreational Lands also overlap a few small patches of CUW on the west end of Parcel 1, and also portions of the CUW block in the south half of Parcel 2. The majority of Recreational Land overlaps with the CUT community in Parcel 1.

Thornbury Acres - TIPP

The only modification proposed for Recreational Lands is the establishment of about 7 km of trails. Limited clearance of existing vegetation will be required for trail creation. Otherwise, there are no proposed changes to existing vegetation. The trail system will traverse High Priority areas/features (FOD, deciduous tree-lines with Butternuts), and also Medium Priority features (CUW). With appropriate mitigation measures (see Section 5.2.3), loss or harm of priority trees can be completely avoided.

5.0 PRESERVATION AND MITIGATION MEASURES

The general objective of this TIPP is to optimize the long term presence of trees, primarily for ecological purposes. This broader objective also tends to confer functional benefits to various land-uses that have been proposed in the FCSP.

The overall objectives are achieved through two means; 1) the retention and protection of existing woody vegetation, and 2) post-construction planting where preservation is not achieved. Combined, preservation and planting efforts should collectively lead to a post-construction presence of prioritized trees that perpetuates and augments that of the pre-construction state.

5.1 General Principles

As a general guiding principle, existing trees should be retained to the extent feasible, and also in consideration of the likelihood of long term viability and value of the trees in question. For the larger trees (>15 cm DBH), retention is the preferable option, where practical.

Trees that are considered for retention (or planting) should be native and representative of the regional ecosystem and the local natural areas. Trees should also be suited to the physical characteristics of the area in question (soil type, drainage). Trees that exhibit nuisance characteristics (e.g. thorns) are less desirable for residential settings. For screening function, trees that are long-lived and native, relatively tall at maturity, and that exhibit robust crowning are recommended. For visual screening purposes, a mix of coniferous and deciduous trees is recommended.

For the CUT and CUW units, retention efforts are best implemented in regard to zones of cover rather than individual tree specimens. Within all community types, some of the dominant tree species (Ashes, Elm) are deemed to be of relatively low priority for retention, and some discretion is warranted.

There are several practices which facilitate post-development survival of retained trees or vegetation zones. These include:

- Placement of protective wrap or fencing around individual trees, or along perimeter of woody vegetation units,
- Placing limits on the depth of excavation or grading within prescribed distance of tree,
- Avoidance of passage of construction vehicles over the root zone of the tree, especially during conditions which are conducive to compaction, and
- Limitation of the installation of impermeable surface (e.g. paved driveways) within and around the root zone.

5.2 Recommended Measures

5.2.1 Servicing and Infrastructure

The following recommendations are provided to mitigate the potential impacts of initial infrastructure construction on existing woody vegetation within the TA Property.

Protective Fencing

At those locations where proposed roadways and their associated right-of-way are within or adjacent to areas of deciduous forest (FOD) or Cultural Woodland (CUW) cover, heavy duty fencing should be placed at the outer limit of disturbance prior to construction onset. This includes the <100m stretch of road traversing the south end of the FOD block in Parcel 1, a roughly 100 m stretch to the immediate east of the access from Grey Road 40, and the roughly 500 m of road in the south half of Parcel 2.

Heavy duty fencing should be 5 feet (~130 cm) in height, with posts on 16-foot spacing. End and corner supports, and every third post in between, should be 4-inch (10-cm) wooden posts. Up to two iron t-bars can be installed as fence support at 16-foot spacing between the heavy wooden posts. Fence material can be page wire or board, or other material to be approved prior to installation. At each end of the fence run, an 8-foot return run of fence should be installed to protect against inadvertent travel around the main fence-line into the protected area.

The installation of the heavy-duty fencing is to be monitored and approved prior to the onset of construction activity. At the time of installation, the fence alignment may be subject to minor alteration to optimize tree protection benefits. Trees that are deemed to be too close to the limit of disturbance and likely to suffer significant damage may be flagged for removal at the time of fence installation.

In locations where the roadway traverses or abuts the CUT community the installation of standard silt fencing for erosion control purposes will be sufficient to protect adjacent vegetation. In CUT locations where standard silt fencing is not proposed (i.e., on the upgradient edge of the disturbed area), measures specifically for tree protection (e.g. light fencing) are not warranted.

Weather-Related Restrictions

To minimize the risk of impaction-related effects, it is recommended that all construction work be subject to policies prohibiting heavy machinery operation during or immediately after periods of significant precipitation. This is particularly important in locations where the work is adjacent to High Priority tree preservation areas (i.e., areas of FOD).

Root Protection

In High and Medium priority locations, road installation and other serving work should be conducted with various measures in place to avoid impacts on root systems of nearby trees that are outside of the limit of disturbance. This would include provisions to avoid work during wet conditions that could lead to soil compaction, and requirements of root pruning when large roots of adjacent trees are damaged during excavation or grading.

5.2.2 Agricultural Lands

Any loss of CUW community as a result of agricultural land-use changes in Parcel 1 (up to about 2 ha total) should be considered in the development of a site-wide compensation planting plan for the Property (see Section 4.3 for further guidance).

Land-use changes in proximity to the deciduous tree-lines in Parcel 2 should avoid the risk of potential indirect effects on retained trees. Changes that lead to disturbance of the root zone of retained trees, through compaction, excavation, or installation of impermeable surface, should be avoided to the extent feasible. In the case of presence of retained butternuts, measure to avoid root zone disturbance should reflect the prescribed RHPZ for the given tree specimens (see Table 3). Otherwise, a general root zone avoidance setback of 10 m is deemed adequate in the context of agricultural landuse.

In the event of site preparation (clearing, grading) for any agricultural use may warrant the use of protective fencing (see discussion in Section 4.2.1). The priority for protective fencing would be tree-lines where butternut specimens are retained.

Consideration should be given to the expansion and/or augmentation of all retained tree-lines to enhance ecological connectivity (see discussion of Plantings in Section 4.3).

5.2.3 Recreational Lands

The selection of specific alignments of proposed trails should be subject to a field-fit process and seek to avoid trees < 15 cm DBH. To reduce risk of indirect effects, materials selected for trail surfacing should be permeable (e.g. gravel, wood chips). Otherwise, recreational lands should be managed to promote long-term viability (i.e., gradual replacement of Ash and Elm) and control invasive species (especially European Buckthorn).

Establishment of long-term management plans for trails needs to consider the possibility of hazards associated with declining trees. Any large trees on or adjacent to trails that are obvious or pending hazards can be removed at the time of trail installation. This may include all Ash specimens with any evidence of EAB infestation. Trembling Aspen and Elm are also anticipated to exhibit relatively high rates of decline, and should be subject to pro-active management along the trail network.

5.2.4 Homesteads

For all homesteads, there are five recommendations that apply:

1. Install protective fencing along the outer limit of the development envelope to protect proposed natural buffers during clearance and construction.
2. Manage buffers to promote long-term viability (i.e., gradual replacement of Ash and Elm) and control invasive species (especially European Buckthorn),
3. Retain trees within building envelope to extent feasible¹, with priority given to any larger (≥ 15 cm DBH) native trees,
4. Implement measures to reduce indirect impacts on retained trees within building envelope and within buffers and increase the likelihood of their long-term survival,
5. Where retention of desired trees within building envelope is not possible, conduct post-development planting within the homestead to partly re-establish some function of those trees that were removed.

In a general sense, the priority to implement these recommendations should be based on the likelihood and potential significance of the impacts. Specific recommendations are provided for those homesteads where meaningful opportunities for the preservation of trees have been identified (see Table 4), and where there is reasonable likelihood of relatively significant impacts. For the following homesteads for which specific tree-protection recommendations are provided, a detailed homestead-specific TIPP should be submitted in support of the eventual building permit application. In summary, this includes Homesteads 1 - 3, 6 - 9, 13, 14, 16, 17 and 28 - 37. For the remaining 16 homesteads, the five aforementioned general recommendations apply but a detailed TIPP is not required. For detailed homestead-specific TIPP purposes, topographical surveys should capture the presence of vegetation blocks or individual trees ≥ 15 cm DBH.

Homesteads 1 – 3 and 7

Plans should target retention and protection of any larger (≥ 15 cm DBH) conifers within the building envelope, except Scots Pine, associated with CUW patches. Naturalized buffers and any plantings within the lots should be managed to have species composition and structure that is generally complimentary to retained or augmented natural vegetation within adjacent Recreational Lands. Combined retention and planting efforts should consider screening function along the lot perimeters facing Grey Roads 2 or 40.

¹ Where large (>30 cm DBH) trees are proposed for preservation, a certified arborist should be consulted if there is notable evidence of decline, if significant limbing may be required, or if there is a likelihood of significant disturbance of the tree's root-zone due to development within or near to the tree's dripline.

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Homesteads 6, 8, 9,13 and 14

Measures to retain and ensure protection of mature deciduous trees in the FOD block at the rear of these lots are recommended. Efforts to minimize soil disturbance and maintain natural woody cover at the back of the building envelope are also recommended. The specification of a 10-m naturalized buffer in the FCSP largely serves this purpose. During clearance and construction, protective fencing should be placed along the drip-line of Aspen specimens that are part of the FOD block, or along the edge of the buffer area (whichever is furthest from the rear lot line).

Homesteads 16 and 17

The FOD community occupying the area between these two homesteads is High Priority. There is no expectation of direct loss or harm of trees. Homestead-specific plans should ensure avoidance of any indirect impacts on root zones of priority trees (i.e. Trembling Aspen measuring ≥ 15 cm DBH). The specification of a 10-m naturalized buffer in the FCSP largely serves this purpose.

Homesteads 28 to 32

Plans should target retention and protection of larger (≥ 15 cm DBH) trees associated with CUW patches. Ash and Elm specimens can be excluded. Lot plans should also ensure that there is no unwarranted alteration within the root harm protection zone (RHPZ) of any retained butternuts located to the immediate rear of any lot. Details of tree locations and RHPZ are provided in Table 3. The specification of a 10-m naturalized buffer in the FCSP largely serves this purpose, but verification of RHPZ is required. During lot clearance and construction, protective fencing should be installed at outer edge of the RHPZ or the edge of the buffer area (whichever is furthest from the rear lot line).

Homesteads 33 - 37

Homestead plans should target retention and protection of larger (≥ 15 cm DBH) trees associated with CUW patches. Ash and Elm specimens can be excluded from protection.

5.3 Planting

Where tree retention is not possible or warranted, post-construction planting can serve to create a long-term presence of tree cover that contributes to overall objectives for the Property.

As noted, a key objective for planting is to offset losses of tree cover in the block of CUW in the south half of parcel 2 that is largely mapped as Significant Woodland. Compensation for loss of Medium or High Priority trees is also a guiding principle. The proposed FCSP identifies 10 lots and associated access road that overlap just under 7 ha of the CUW community in Parcel 2. The FCSP identifies naturalized lot buffers that total

about 2.5 ha, leaving a net area of about 4.5 ha where existing CUW vegetation is assumed to be slated for removal. In Parcel 1, there are small pockets of CUW and one small patch of FOD where tree removal is expected to accommodate either agriculture, access road or residential lots. These areas total around 2 ha. Combined, the proposed FCSP indicates probable removal of up to almost 7 ha of woody vegetation that is primarily Medium Priority, but includes about 0.1 ha that is deemed to be High Priority. As compensation, post-construction planting within the TA property should target a similar total planted area. Preferable, plantings should occur in areas that are open or occupied by communities with low tree cover (CUT, CUM). Augmentation plantings can be considered in the overall planting objective. In areas currently occupied by CUT or CUM communities, spot plantings can be designed to facilitate transition to woodland or forest communities.

In keeping with established principles, tree plantings should consist of native species that are suitable to the local conditions. Table 2 provides a summary of the native tree species that are currently present within the Property, and would therefore be candidates for inclusion in planting efforts. Certain tree species listed in Table 2 are identified as preferred candidates for planting. In addition, there are few tree species that are not currently found within the Property but which are common to in the TOBM that are identified as candidates for inclusion in planting plans. These include:

- Balsam Fir (*Abies balsamea*) - coniferous tree with Wetness Coefficient of -3, adaptable to a variety of soil and climate conditions
- Red Maple (*Acer rubrum*) - deciduous tree with Wetness Coefficient of 0, often found in low areas with moist soil
- Silver Maple (*Acer saccharinum*) - deciduous tree with Wetness Coefficient of -3, typically found in swamps or bottomlands, but can also grow well when planted in upland conditions
- American Larch (*Larix laricina*) - coniferous tree with Wetness Coefficient of -3, typically found on moist or wet soils, but can also grow well when planted in upland conditions without too much competition

The location and configuration of plantings, or augmentation areas, should consider ecological function as well as potential functionality in residential or agricultural contexts. In general, plantings should occur in locations that are adjacent to blocks of retained natural vegetation so as to enhance or expand ecological function of that existing vegetation. Planting configuration should target minimum area of 0.1 ha and minimum dimensions of 20 m. Planting location and configuration should also consider the creation or enhancement of connectivity between existing blocks of natural vegetation.

In consideration of these various factors pertaining to location and configuration, there are some core locations where planting can be considered:

- frontages along Grey Road and Hwy 40 (approximately 1600 m total) - facilitates ecological connectivity and provides wind-break and view-scape benefits,
- any areas currently occupied by CUT or CUM communities that are not proposed for land-use change, particularly along the southern boundary of the Property and abutting the FOD block in Parcel 1 to augment connectivity, and
- along the boundary of Parcel 1 and Parcel 2 to expand and enhance the existing tree-line sections and facilitate north-south connectivity.

In general, the soils within the TA property exhibit poor and slow drainage. Any planting plans developed for locations where no grading or drainage amendment is proposed should include species that are tolerant of such soil conditions. This includes species listed in Table 2 with a Wetness Coefficient of 0 or less. The 6-ha cultivated area at the north end of Parcel 2 is tile-drained, and any planting in this area is not expected to be constrained by poor drainage.

In the case of Butternuts, this species is not well suited to poor drainage and shade from competing trees. Any plantings other than those proposed for agricultural purposes (i.e. as part of food forest areas) should be planned in consultation with the Ministry of Environment, Conservation and Parks (MECP) to ensure consistency with conservation management objectives for this SAR.

For any planting within lots, species selection and tree location should consider potential implications to building foundations and septic beds. The roots of some species can extend widely and cause damage to these structures. Inclusion or placement of any species may need to consider this potential constraint. Trembling Aspen have vigorous lateral root growth and should generally be excluded in any plantings within residential lots.

5.4 Invasive Species Removal

To enhance the natural function of all retained areas of woody vegetation within the Property, invasive species removal should be incorporated into the overall management plans for the Property. Table 2 identifies several woody invasive species that are present within the Property. European Buckthorn should be a priority target for removal, as this species is commonly encountered in all woody vegetation communities and is particularly abundant in the FOD and CUW communities that are prioritized for preservation.

6.0 SUMMARY

6.1 Existing Vegetation

Presently, about 90% of the TA Property is occupied by vegetation communities that are primarily woody (trees and/or shrubs) and largely influenced by the land management history of the Property. These woody communities are mainly deciduous and comprised largely of shrubs and young trees that are typical of early succession lands in the region. Following the ELC system, the early succession communities within the Property include Cultural Thickets (CUT) and Cultural Woodlands (CUW) which in combination account for a bit more than 80% (~50 ha) of the Property. About 6 ha (~10%) of the Property is currently occupied by Cultural Meadow (CUM) communities, largely in the form of active crop lands.

Aside from the prevailing Cultural communities, there is a single 5-ha patch in Parcel 1 that is the only portion of the Property where tree cover is substantial enough to warrant designation as a "forest" community. The canopy of this forest block is heavily dominated by Trembling Aspen, which is typically an early succession species. This forest patch is consistent with the Fresh-Moist Poplar Deciduous Forest (FOD8-1) under the ELC system. Mature forest communities or late-succession communities typical of the region are not found within or immediately adjacent to the Property.

Direct on-site surveillance of the TA Property has revealed the presence of 55 Butternut specimens. Regulatory consultation with the MECP may be required at some point in the planning process.

6.2 Opportunities and Priorities

The nature of existing vegetation within the TA Property has been used to identify and relatively rank opportunities for meaningful retention of trees within the Property. The assessment of development-related impacts (Section 4) and the preservation/mitigation recommendations (Section 5) reflect these opportunities and priorities in a comprehensive manner. The opportunities and assigned relative priorities for each community are as follows:

- Cultural Thicket (CUT) - no meaningful opportunities for tree preservation - Low Priority.
- Cultural Woodland (CUW) in Parcel 1 - - Medium Priority ((primarily in consideration of Viewscape benefits).
- Cultural Woodland (CUW) in Parcel 1 - Medium Priority (primarily in consideration of Significant Woodland designation).
- Aspen Deciduous Forest (FOD8) - High Priority (in consideration of Significant Woodland designation and substantial presence of native trees ≥ 15 cm DBH).

- Norway Spruce Tree-Lines - Low Priority - may serve non-ecological objectives (view-scape, wind-break).
- Deciduous tree-lines in Parcel 2 - High Priority (primarily due to presence multiple butternut specimens)

6.3 Impacts of Development

Infrastructure and Servicing

The FCSP identifies about 2.2 km of road within the Property. The majority of this area lies within the Low Priority CUT community in Parcel 1. About 1.5 ha of road overlaps the Medium Priority CUW community, mostly in Parcel 2, and 0.1 ha is located in the southern end of the High Priority FOD community in Parcel 1. The installation of roads within each of these areas will result in direct loss of existing woody vegetation within the limit of disturbance, and will also pose some risk of indirect impacts on trees along the immediate perimeter of the area of disturbance.

The FCSP identifies an SWM pond in the northeast corner of the Property where no woody vegetation is present. There is no anticipation of large scale pre-construction site grading for drainage or SWM purposes. Overall, site alterations relating to drainage and SWM are not expected to result in meaningful loss or harm of Medium or High Priority communities within the Property

Agricultural Lands

Agricultural activities in close proximity to deciduous tree-lines in Parcel 2 could lead to root zone impacts on retained Butternut specimens located within those tree-lines. Any displacement of CUW patches in Parcel 1 will result in loss of trees that are considered Medium Priority, mainly from a potential view-scape perspective.

Recreational Lands

In Recreational Lands, the proposed trail system will traverse High Priority areas/features (FOD, deciduous tree-lines with Butternuts), and also Medium Priority features (CUW). There is a low risk of direct or indirect impact on relatively large (≥ 15 cm DBH) native tree specimens in these locations.

Homesteads

Relatively High Priority trees (FOD and tree-lines with Butternuts) are located along the outer margins of 12 of the 37 proposed homesteads. There are an additional 9 homesteads which overlap CUW communities which are designated as Medium Priority for tree preservation. Eventual development will unavoidably result in loss of existing natural vegetation within the cleared portion of each of these homestead. Homestead

development also has potential for indirect impacts on retained trees within and adjacent to the building envelopes, primarily through root zone disturbance and also from inadvertent contact during clearance of construction.

6.4 Recommendations

Infrastructure and Servicing

Exclusion barriers and other root zone protection measures should be applied in key locations during the infrastructure construction phase. This includes any areas of work within or immediately adjacent to the Aspen Forest (FOD8) in Parcel 1 and the deciduous tree-lines in Parcel 2 where Butternut specimens are located.

Agricultural Lands

In agricultural lands, any losses of priority trees (i.e., native species ≥ 15 cm DBH) in the CUW community should be considered for compensation in the post-construction planting scheme for the Property. Site preparation (clearing, grading) for any agricultural use may warrant the use of protective fencing along deciduous tree-lines where retained Butternut specimens are present. Planning of post-construction agricultural activities should ensure that the root zone of retained Butternuts within deciduous tree-lines is effectively protected.

Recreational Lands

The selection of specific alignments of proposed trails should be subject to a field-fit process and seek to avoid trees ≥ 15 cm DBH. To reduce risk of indirect effects, materials selected for trail surfacing should be permeable (e.g. gravel, wood chips). Otherwise, recreational lands should be managed to promote long-term viability (i.e., gradual replacement of Ash and Elm) and control invasive species (especially European Buckthorn).

Homesteads

All homesteads are subject to a few general recommendations to optimize post-development presence of trees through retention, protection and planting efforts.. In addition, site-specific TIPPs are recommended for 21 homesteads where relatively High or Medium Priority trees are present and may be affected by eventual development. This includes homesteads 1 - 3, 6 - 9, 13, 14, 16, 17 and 28 - 37. This document is to serve as master TIPP for reference in the eventual preparation of detailed TIPPs for specified individual homesteads.

7.0 REFERENCES

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TABLES

Table 1: Summary of ELC Community Characteristics

Community Type ¹	Approx. Area (ha)	Woody Vegetation Characteristics			Tree Size (DBH) Distribution ⁴			Butternut Presence	VPP Opportunities and Priorities
		Tree Cover ²	Composition ³	Age and Structure	<15 cm	15 to 30 cm	>30 cm		
Cultural Meadow (CUM)	6.6	<5%	primarily row crops (rotation)	Not applicable (NA)	NA	NA	NA	Butternuts confined to remnant stone fence-lines bisecting or bordering portions of the CUM community in Parcel 2	General absence of woody vegetation other than treelines. No priority.
Cultural Thicket (CUT)	37.4	20%	Ash>Red Osier Dogwood>Elm	Early succession. Even-aged. No forest structure.	100%	0%	0%	Butternuts confined to remnant stone fence-lines bisecting or bordering portions of the CUT community in Parcel 2	General absence of native trees >15 cm DBH, other than treelines. Low priority.
Cultural Woodland (CUW) - Coniferous (Parcel 1)	3.2	60%	Cedar=Pine=Spruce	Young and even aged. No structural layering.	80%	20%	0%	No Butternut specimens present	Small patches with one or two species of native and non-native conifers dominant. Medium Priority.
Cultural Woodland (CUW) - Deciduous (Parcel 2)	9.0	50%	Ash>>Elm=Cedar	Young and even aged. Minor structural layering.	75%	25%	5%	Butternut specimens present along remnant stone fence-lines on north and east perimeter	A mix of a few native early succession species, with limited presence of specimens >15 cm DBH. Mapped as Significant Woodlands. Medium Priority.
Fresh-Moist Poplar Deciduous Forest (FOD8-1)	4.7	85%	Trembling Aspen>>>White Ash	Relatively young and even aged. Limited layering.	40%	40%	20%	No Butternut specimens present	Tree almost entirely one native early succession species, with regular presence of specimens >15 cm DBH. Mapped as Significant Woodlands. High priority.

1 - Community type as per ELC (Lee et al., 1998). See Figure 2.

2 - estimate of average absolute cover of upper layer, as per Lee et al. 1998

3 - estimate of relative abundance of woody species, as per Lee et al., 1998

4 - estimated percentage of trees in the noted range of diameter at breast height (DBH)

Table 2: Tree and Shrub Species Observed at the TA Property

Common Name	Scientific Name	Presence and Abundance ¹		Native vs Non-Native Status	Wetness Coefficient ²
		Parcel 1	Parcel 2		
Alder-leaved Buckthorn	<i>Endotropis alnifolia</i>	R	R	Native	-5
Alternate-leaved Dogwood ⁴	<i>Cornus alternifolia</i>	O	O	Native	3
American Basswood	<i>Tilia americana</i>	O	O	Native	3
Balsam Poplar	<i>Populus balsamifera</i>	O		Native	-3
Bebb's Willow	<i>Salix bebbiana</i>	O	O	Native	-3
Black Locust ³	<i>Robinia pseudoacacia</i>		R	Non-native	3
Butternut	<i>Juglans cinerea</i>		O	Native	3
Choke Cherry	<i>Prunus virginiana</i>	O	O	Native	3
Cockspur Hawthorn	<i>Crataegus crus-galli</i>	O	O	Native	0
Common Elderberry	<i>Sambucus nigra</i>	O		Native	-3
Common Pear	<i>Pyrus communis</i>	O	O	Non-native	5
Domestic Apple	<i>Malus pumila</i>	O	O	Non-native	5
Dotted Hawthorn	<i>Crataegus punctata</i>	O	O	Native	5
Downy Hawthorn	<i>Crataegus mollis</i>	O	O	Native	0
Eastern Red Cedar	<i>Juniperus virginiana</i>	R	R	Native	3
Eastern White Cedar ⁴	<i>Thuja occidentalis</i>	A	A	Native	-3
Eastern White Pine ⁴	<i>Pinus strobus</i>	O		Native	3
European Buckthorn ³	<i>Rhamnus cathartica</i>	A	D	Non-native	0
European Mountain-ash	<i>Sorbus aucuparia</i>	R	O	Non-native	5
European Red Currant	<i>Ribes rubrum</i>	R		Non-native	5
Gooseberry	<i>Ribes oxycanthoides</i>	R		Native	3
Highbush Cranberry	<i>Viburnum trilobum</i>	R	R	Native	-3
Lilac ³	<i>Syringa vulgaris</i>		R	Non-native	5
Manitoba Maple ³	<i>Acer negundo</i>	R		Native	0
Norway Spruce	<i>Picea abies</i>	O	O	Non-native	5
Peach-leaved Willow ⁴	<i>Salix amygdaloides</i>	R	R	Native	-3
Pin Cherry ⁴	<i>Prunus pensylvanica</i>		R	Native	3
Pussy Willow	<i>Salix discolor</i>	O	O	Native	-3
Red Ash ⁵	<i>Fraxinus pennsylvanica</i>	O	O	Native	-3
Red Elderberry	<i>Sambucus racemosa</i>	R		Native	3
Red Pine	<i>Pinus resinosa</i>	O		Native	3
Red-osier Dogwood	<i>Cornus sericea</i>	D	D	Native	-3
Round-leaved Dogwood ⁴	<i>Cornus rugosa</i>	O	O	Native	5
Sandbar Willow	<i>Salix interior</i>	R		Native	-3
Scots Pine ³	<i>Pinus sylvestris</i>	O		Non-native	3
Shining Willow	<i>Salix lucida</i>		R	Native	-3
Slender Willow	<i>Salix petiolaris</i>	R		Native	-3
Sugar Maple ⁴	<i>Acer saccharum</i>	R	R	Native	3
Tatarian Honeysuckle ³	<i>Lonicera tatarica</i>	O	O	Non-native	3
Trembling Aspen	<i>Populus tremuloides</i>	O	O	Native	0
White Ash ⁵	<i>Fraxinus americana</i>	D	D	Native	3
White Elm	<i>Ulmus americana</i>	O	O	Native	-3
White Spruce ⁴	<i>Picea glauca</i>	O	R	Native	3

1. As per ELC procedures (Lee et al., 1998) - R = Rare, O = Occasional, A = Abundant, D = Dominant

2. Coefficients as reported by Oldham et al., 1995

3. species is considered to be invasive, and should be identified for removal for enhancement purposes

4. species is recommended as a candidate for inclusion in planting plans

5. Ash species not recommended for retention or planting due to implications of Emerald Ash Borer

Table 3: Summary of Butternut Specimens at TA Property

ID #	Location (UTM) ¹		DBH (cm) ²	Root Harm
	easting	northing		Prevention Zone ³ (m)
1	546092	4931743	15	12
2	546113	4931624	12	9
3	546114	4931610	38	18
4	546114	4931600	23	12
5	546113	4931597	5	9
6	546120	4931571	97	25
7	546122	4931557	20	12
8	546122	4931557	38	18
9	546128	4931544	18	12
10	546127	4931542	16	12
11	546126	4931526	<3	6
12	546131	4931524	<3	6
13	546133	4931496	27	12
14	546132	4931492	3	9
15	546139	4931477	28	12
16	546142	4931402	25	12
17	546164	4931325	40	18
18	546162	4931300	6	9
19	546162	4931299	<3	6
20	546153	4931311	15	12
21	546163	4931293	7	9
22	546162	4931325	35	18
23	546160	4931302	7	9
24	546146	4931310	13	9
25	546136	4931344	13	9
26	546135	4931347	<3	6
27	546125	4931340	4	9
28	546122	4931393	25	12
29	546114	4931397	31	18
30	546097	4931373	43	18
31	546036	4931364	17	12
32	546022	4931367	7	9
33	545866	4931320	<3	6
34	545818	4931315	11	9
35	545982	4931396	8	9
36	545981	4931398	11	9
37	545987	4931405	13	9
38	545979	4931411	12	9
39	545977	4931420	50	25
40	545973	4931430	28	12
41	545972	4931461	49	18
42	545971	4931476	29	12
43	545971	4931476	27	12
44	545971	4931478	17	12
45	545962	4931488	17	12
46	545961	4931504	27	12
47	545958	4931510	26	12
48	545958	4931511	39	18
49	545953	4931526	12	9
50	545970	4931460	11	9
51	545984	4931450	<3	6
52	545977	4931445	<3	6
53	545988	4931371	41	18
54	545987	4931372	11	9
55	546102	4931488	<3	6

1 - Universal Transverse Mercator (UTM) coordinates, NAD83 datum. Generally accurate within 3 m or less

2 - rounded to nearest cm

3 - as per O.Reg. 830/21

Table 4: Summary of Tree Presence and Implications - Homesteads

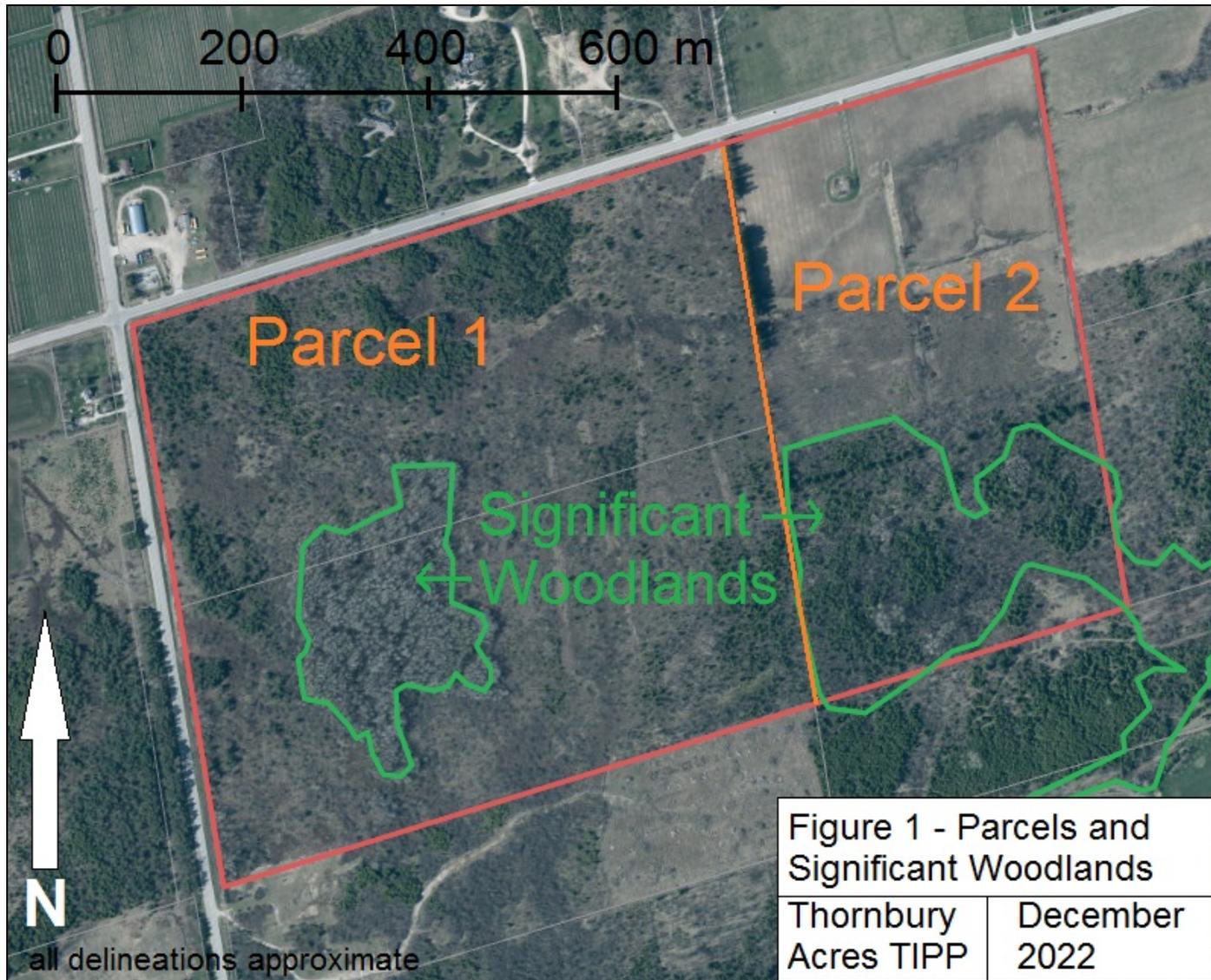
Homestead Number	Community ¹	Potential for Medium or High Priority Impact		Functional Benefit		Lot-specific TPP Required ³
		Direct	Indirect	NHS ²	View-scape	
1 - 3	CUT	No	No	No	No	Yes
	CUW	No	No	No	Yes	
4 - 5	CUT	No	No	No	No	No
6	CUT	No	No	No	No	Yes
	FOD	Yes	Yes	No	No	
7	CUT	No	No	No	No	Yes
	CUW	No	No	No	Yes	
8 - 9	CUT	No	No	No	No	Yes
	FOD	Yes	Yes	No	No	
10 - 12	CUT	No	No	No	No	No
13 - 14	CUT	No	No	No	No	Yes
	FOD	No	Yes	No	No	
15, 18-27	CUT	No	No	No	No	No
16 - 17	CUT	No	No	No	No	Yes
	FOD	No	Yes	No	No	
28 - 32	CUW	Yes	Yes	Yes	No	Yes
33 - 37	CUW	Yes	Yes	No	No	Yes

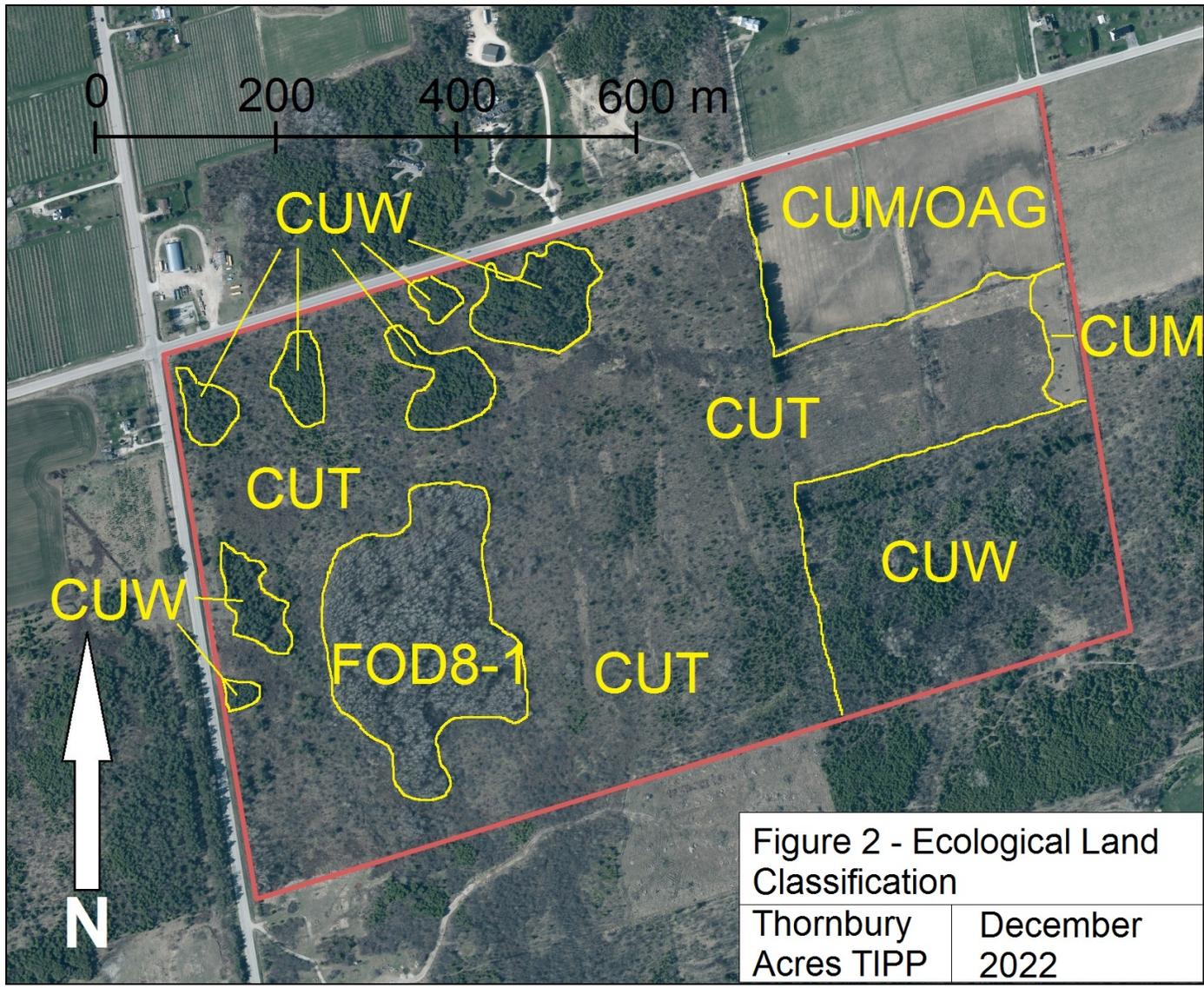
1 - see Section 2.2 and Figure 2

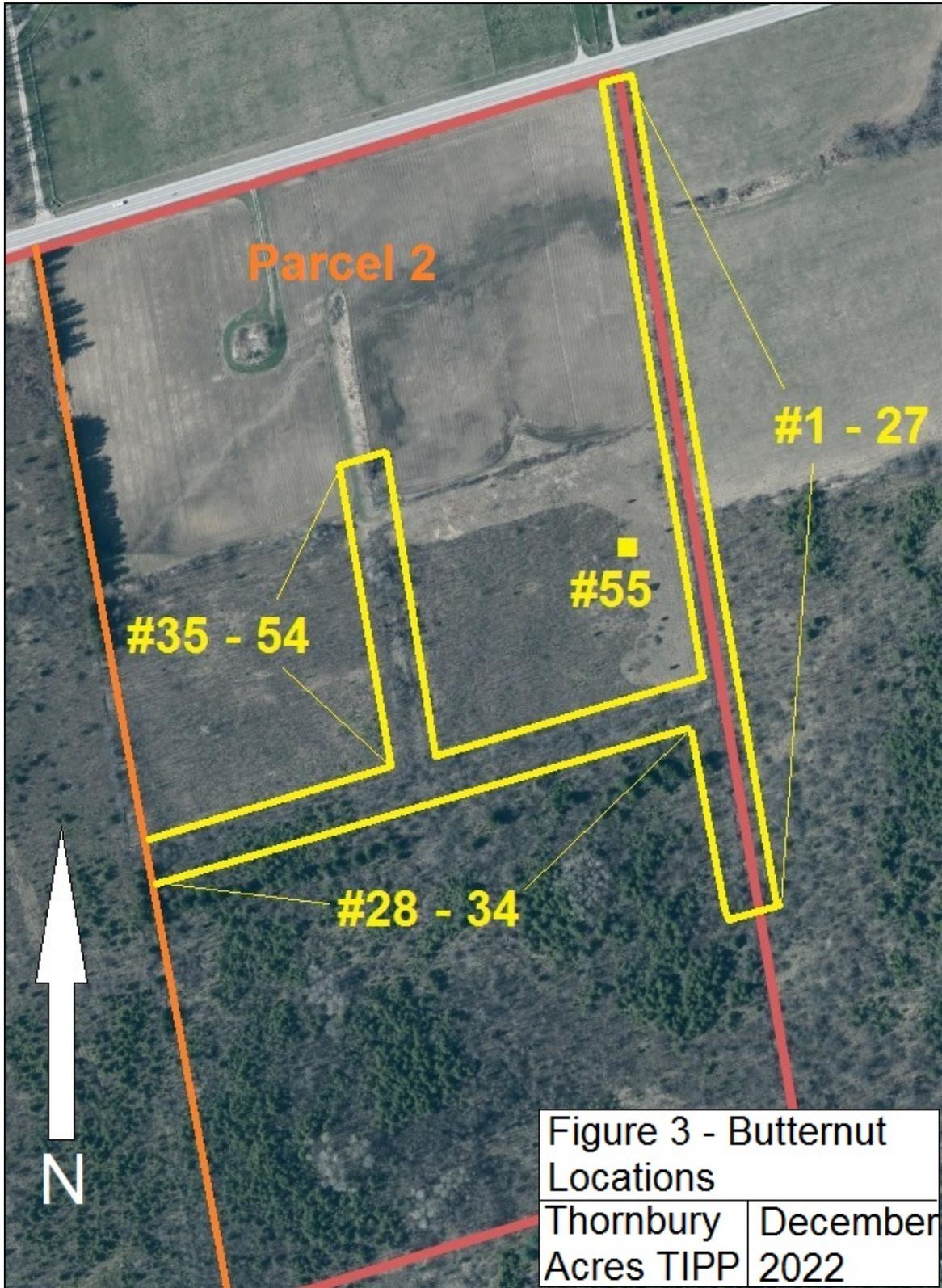
2 - NHS = Natural Heritage System

3 - see Section 5.2.4

FIGURES

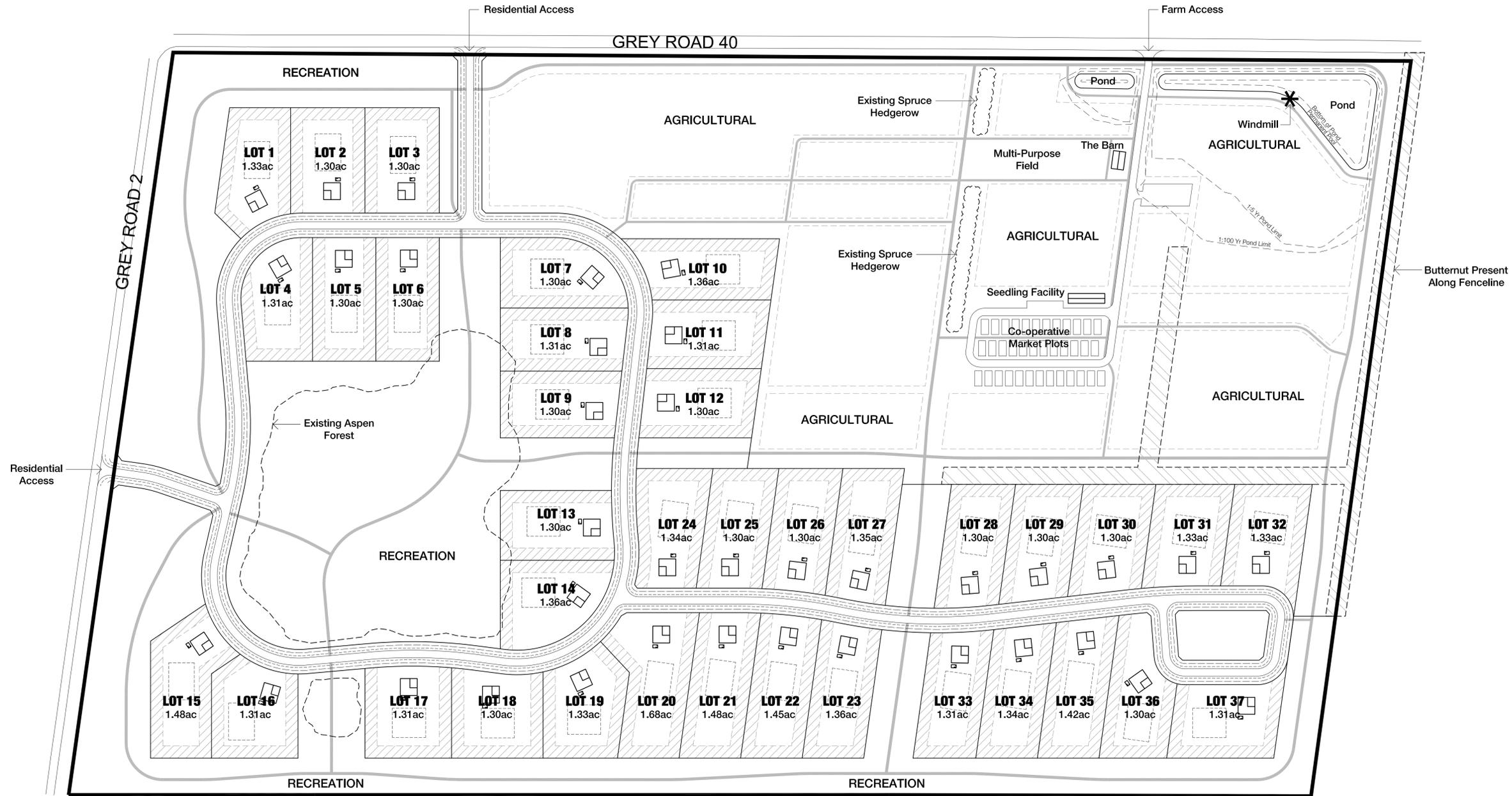






Appendix A - Farm Co-operative Site Plan

THORNBURY ACRES
THORNBURY, ONTARIO



- LEGEND**
- Site Boundary
 - ▨ Naturalized Lot Buffer
 - ▤ Butternut Tree Presence
 - Trails
 - * Site Feature

SUMMARY

Site Area:	±151.5ac
Total Lot Count:	37
Road Length:	2,205.4m
Trail Length:	7.1km
Total Residential:	49.6ac (32.8%)
Residential - Cleared Area:	28.7ac (19.0%)
Residential - Naturalized Lot Buffer:	20.9ac (13.8%)
Road:	10.9ac (7.2%)
Residential + Road:	60.6ac (40.0%)
Agricultural Lands:	52.1ac (34.4%)
Recreational Lands:	38.8ac (25.6%)
Agricultural / Recreational Lands:	91.0ac (60.0%)
Total Open Space (Ag, Rec and Lot Buffer)	111.9ac (73.8%)

NORTH

NAK
design strategies

421 RONCESVALLES AVENUE, TORONTO, ON M6R 2N1 CANADA
T 416.340.8700 F 416.340.7100 NAKDESIGNSTRATEGIES.COM

SCALE | 1:1750

0 25M 50M 75M

DATE | 12.02.2022 PROJECT | 21-087

SP-08

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