

Butternut Assessment Guidelines:

Assessment of Butternut Tree
Health for the Purposes of the
Endangered Species Act, 2007

December 2021

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1. Purpose

These guidelines provide direction on how a health assessment of Butternut (*Juglans cinerea* L.) must be conducted for the purposes of the **Endangered Species Act, 2007** (ESA) and specifically pursuant to the species-specific conditional exemption for Butternut in **O. Reg. 830/21** (Exemptions – Barn Swallow, Bobolink, Eastern Meadowlark and Butternut).

These guidelines have been amended in conjunction with amendments to the Butternut conditional exemption and the making of **O. Reg. 829/21** (Species Conservation Charges). They are incorporated by reference and contain complementary requirements to those regulations. These guidelines should be read in conjunction with the ESA and those regulations.

The information presented in these guidelines is not and should not be considered legal advice. Review the ESA and information on the laws that apply to protected species in Ontario. Consult a lawyer if you have any questions about the application or interpretation of Ontario laws or if you have other legal questions.

2. Overview

2.1 Species Status

Butternut is listed as endangered on the **Species at Risk in Ontario List** (SARO List) in O. Reg. 230/08. While Butternut is a widespread tree species that can be found throughout much of southern Ontario, many Ontario trees are infected with Butternut Canker (*Ophiognomonia clavigignenti-juglandacearum*)¹: a fungal disease that often results in tree mortality. The endangered status of Butternut is based on observed and predicted declines due to Butternut Canker. While Butternut Canker is the fundamental threat to the species, it is also threatened by harvesting, habitat loss, hybridization with exotic Walnut (*Juglans*) species, other diseases, insects, and exotic pests. While diseases (other than Butternut Canker), insects, and exotic pests would not likely cause population declines on their own; they weaken the tree and make it more susceptible to Butternut Canker.

1. Until recently this fungus was known as *Sirococcus clavigignenti-juglandacearum*.

2.2 Relevant Legislation

Butternut is classified as an endangered species on the SARO List and therefore it and its habitat are protected under the ESA. Section 9 of the ESA includes prohibitions against killing, harming, harassing, capturing or taking Butternut. Section 10 of the ESA includes prohibitions against damage or destruction of Butternut habitat.

The conditional exemption for Butternut in Part V of O. Reg. 830/21 provides an exemption to the section 9 and 10 prohibitions in certain circumstances and for certain actions. For the exemption to apply, a person must comply with all the conditions to the exemption. Alternatively, a person may seek authorization of these actions under a permit or agreement issued under the ESA.

These guidelines contain procedures that inform how a Butternut tree is classified into one of three categories. Classification is relevant to whether and how the conditional exemption applies to a Butternut tree and the extent of required beneficial actions for impacted trees in a permit or agreement. In addition, parts of the guidelines are used to inform the calculation of species conservation charges, as prescribed in O. Reg. 829/21.

2.3 Categories of Butternut

Butternut trees are classified into three categories by O. Reg. 830/21. The categories relate to a Butternut tree's ability to contribute to the protection or recovery of the species and its utility in determining possible sources or mechanisms of resistance to Butternut Canker.

In order to satisfy one of the prerequisite conditions of ss. 25 (2) of O. Reg. 830/21, and prior to registering an activity under the conditional exemption, a person who is a "Butternut Health Expert" (BHE) as defined by O. Reg. 830/21 must assess the health of the Butternut trees that will be impacted using the procedures set out in these guidelines. The report required to be prepared by the BHE must identify the category of each assessed Butternut tree. In addition, the categorization of a Butternut tree is used to determine the amount of a species conservation charge for Butternut, in accordance with O. Reg. 829/21.

A BHE must record their observations for each tree using data collection and reporting tools provided by the Ministry of the Environment, Conservation and Parks (MECP). These tools will be used by the BHE during a Butternut health assessment to determine the appropriate category for each assessed tree. The BHE must document the results of the assessment in writing and provide a report that includes the information required by O. Reg. 830/21 to the person who requested the health assessment. See **section 4** for more details about the BHE Report and assessment tools.

Categories of Butternut trees, as defined in O. Reg. 830/21

Category 1 Butternut tree

The Butternut tree is affected by Butternut Canker to such an advanced degree that retaining the tree would not support the protection or recovery of Butternut trees in the area in which the tree is located.

Category 2 Butternut tree

The Butternut tree is not affected by Butternut Canker or the Butternut tree is affected by Butternut Canker but the degree to which it is affected is not as advanced as a Category 1 Butternut tree and retaining the tree could support the protection or recovery of Butternut trees in the area in which the tree is located.

Category 3 Butternut tree

The Butternut tree may be useful in determining sources of resistance to Butternut Canker.

3. Butternut Health Assessments

Butternut health assessments are undertaken when a proposed activity is likely to result in the killing, harming or taking of Butternut trees. They are also used to inform activities undertaken to assist in the protection and recovery of Butternut (e.g., to identify trees for seed collection, archiving or breeding programs, or for research). The responsibilities of the BHE and the procedures to be followed are the same for all health assessments conducted for the purposes of the ESA, regardless of the underlying reason for the assessment.

The BHE must assess the health of the Butternut tree(s) in question and determine all of the following for each tree:

- the class to which the Butternut tree belongs (Category 1, 2, or 3);
- whether the tree is a putative hybrid; and
- whether the tree is believed to be naturally occurring or cultivated.

3.1 Determining the Appropriate Category

Determining the category of a Butternut tree is the main objective of a Butternut health assessment. Numbered categories are used, as defined in O. Reg. 830/21.

Categories 1 and 2

The identification of Category 1 and 2 trees is based on an assessment of the percentage of crown branches that are affected by Butternut Canker and the abundance (or absence) of cankers on the main trunk (also referred to as the bole) and root flare². There are variations in the terminology used to describe the percentage of crown branches that are affected by Butternut Canker. Within this document (and in the reporting tools listed in section 4.1), the percentage of crown branches that are **not** affected by Butternut Canker is abbreviated in some contexts and referred to as the percentage of "live crown".

Assessment of the crown must be conducted when leaves are present. Detail regarding the timing of assessments is provided in section 3.7 of this document. Guidance regarding how the crown and cankers are to be assessed is provided toward the end of this section.

The criteria to be applied when determining whether a tree belongs in Category 1 or 2 are described below. Trees must also be considered against the criteria for Category 3 before the assessment is finalized. The data collection and reporting tools will calculate each tree's category using the data entered by the BHE.

A Butternut tree is considered to be a Category 2 tree on a preliminary basis³ if **any** of the following statements are true. A Butternut tree is considered to be a Category 1 tree only if **all** of the following statements are false.

- a) There are no cankers on the main trunk (excluding any root flare cankers) and 50% or more of crown branches are unaffected by Butternut Canker.
- b) The total of the assigned canker widths for cankers observed on the main trunk (excluding any root flare cankers) equals less than 20% of the circumference of the main trunk; and more than 70% of crown branches are unaffected by Butternut Canker.
- c) The total of the assigned canker widths for cankers observed on the main trunk and on the root flare combined equals less than 20% of twice the circumference of the main trunk; and more than 70% of crown branches are unaffected by Butternut Canker.

2. Illustrations can be found in the following two publications:

1. Ostry, M., M. Mielke and D. Skilling. 1994. Butternut – Strategies for Managing a Threatened Tree. General Technical Report NC-165. USDA Forest Service, North Central Forest Experimental Station, St. Paul, Minnesota.
2. Forest Gene Conservation Association. 2010. Butternut Health Assessment in Ontario – Finding Retainable Trees. Revised ed. Forest Gene Conservation Association, Peterborough, Ontario.
3. This is referred to as the preliminary result because Category 2 Butternut trees may also satisfy the criteria for Category 3.

Category 3

Some Butternut trees exhibit evidence that they may be resistant to or tolerant of infection by Butternut Canker, or their symptoms of infection are less severe in comparison with other trees that have been infected to a similar extent. These trees, and trees associated with them⁴, may provide insight into whether some Butternut trees are resistant⁵ to Butternut Canker. The resistance exhibited by these trees may be attributed to putative genetic or heritable traits, in which case they are considered to be candidates for archiving. Information acquired from the study of Category 3 trees where they naturally occur may lead to advancements in silvicultural practices that could be applied to enhance environmentally based resistance to Butternut Canker. Accordingly, Category 3 trees are especially important to the recovery of Butternut.

A previous version of this document referred to a class of Butternut trees as “putatively resistant”. These trees have also been referred to as “archivable.” For clarity, a tree that has been identified by a BHE as a Category 3 tree is a candidate for archiving. In certain cases, a Category 3 tree may be required to be archived by a condition of an exemption or by an ESA permit or agreement.

A Category 3 tree is one that both satisfies the criteria for Category 2 and has had prolonged exposure to Butternut Canker. Prolonged exposure is determined based on the tree having a minimum stem diameter (as specified below) and being within a set distance from a tree that is severely affected by Butternut Canker. The health of the tree under these circumstances is presumptive evidence that it has some form of resistance to Butternut Canker.

A Butternut tree is considered to be a Category 3 tree if it exhibits resistance to Butternut Canker, based on observation that:

- (i) it satisfies the criteria for Category 2;
- (ii) it has a stem diameter of at least 20 cm; and
- (iii) it occurs within 40 m of at least one Butternut tree which is severely affected by Butternut Canker (including a severely affected tree that is no longer standing).

In some cases, the BHE may not be able to access Butternut trees on neighbouring properties to determine whether the tree being assessed is within 40 m of a Butternut tree which is severely affected by Butternut Canker. In this scenario, the conclusion regarding the categorization shall be made based on the information that is available to the BHE. The BHE should take reasonable steps to determine whether there may be Butternut trees beyond the property line that could have an impact on the categorization of the tree(s) being assessed (e.g., seeking permission from the property owner, or if sufficient evidence can be observed, assessing whether the trees are severely affected by Butternut Canker without crossing the property line).

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- 4. Archiving efforts are not limited to Category 3 trees. Category 2 trees can also contribute to archiving and research.
 - 5. In this context, the word “resistant” shall be interpreted to include that which is often referred to using the word “tolerant.”

3.2 Assessment of Live Crown

Live crown is defined as the part of the crown that would be expected to produce leaves in the absence of Butternut Canker. In other words, when assessing the percentage of live crown, branch mortality attributable to causes other than Butternut Canker, such as storm damage or shading, must be excluded from the estimate. Dead interior and lower crown branches should be considered to have died from shading unless cankers are visible on them. This is important to note because a tree with a very small crown volume may still have an estimated live crown of 75% (or even 100%) when causes for branch mortality unrelated to Butternut Canker are discounted.

The BHE will need to keep in mind that Butternut trees can vary considerably in crown size and volume. To ensure that variability in crown size does not affect the estimated percentage of live crown, the BHE should begin with an observation of whether the tree has a large open crown or whether it has a small or narrow crown (e.g., due to neighbouring trees) and then scale their estimation of the percentage of live crown accordingly.

Another important consideration is that the density of the crown foliage (i.e., the degree to which the foliage obstructs views of the sky) will not necessarily correlate directly to the percentage of live crown. For example, even a tree with 100% live crown will likely have large gaps in the foliage of the crown. The BHE should focus on whether the branches in the sunlit portion of the crown are producing leaves (and whether cankers are visible on the branches) rather than the density of foliage in the crown.

The surrounding trees and shrubs may be observed for contextual information if it is suspected that other factors have affected the tree's crown (e.g., atypical timing for stage of leaf development or evidence of leaf predation). If Butternut Canker is responsible for the loss of crown volume, this can usually be determined by observing evidence of canker on the dead limbs or the main trunk.

The prohibitions in clause 9 (1) (a) of the ESA apply to all living members of a species listed on the SARO List. If the Butternut is standing but possibly dead, the BHE should apply the criteria to determine whether the tree belongs in Category 1. The BHE should record their observations using the data collection tools and document the tree's categorization in the BHE Report.

3.3 Assessment of Butternut Cankers

Butternut Cankers are diseased areas that develop under the bark. They appear as dark, sunken cankers that are often elliptical in shape. The purpose of assessing the extent of Butternut Canker on the trunk is to estimate the likelihood that the Butternut Cankers on the tree's cambial surface area below the crown will kill the tree by girdling it and impeding the flow of water and nutrients.

To determine the percentage of the main trunk and root flare that is affected by Butternut Canker, the BHE shall count all cankers found on the main trunk and the root flare and record the totals in the appropriate fields on the data collection form (e.g., sooty, open, above/below 2 m, or at the root flare). The data collection and reporting tools will calculate the percentage of the main trunk and root flare that is affected by Butternut Canker based on the number of Butternut Cankers recorded, their type (i.e., open or sooty) and their location on the tree.

To perform this calculation, the formulae in the data collection and reporting tools will apply standardized canker widths to the number of cankers recorded. The assigned widths differ based on the canker type (i.e., an open canker is assigned a width of 5 cm and a sooty canker is assigned a width of 2.5 cm) and their location on the tree (e.g., root flare, below 2 m or above 2 m). The total of the assigned canker widths is divided by the tree's circumference to determine the percentage of the main trunk that is affected by Butternut Canker (circumference is automatically estimated based on the value recorded for tree stem diameter). For the calculation of the percentage of the main trunk and root flare that is affected by Butternut Canker, the circumference value is doubled. The calculations applied in the data collection and reporting tools may require amendment in the future as research yields new information. BHEs should ensure they are using the most up to date versions of these tools.

It is recommended that BHEs conduct health assessments during dry weather conditions only because wet surfaces can make it difficult to accurately detect the number and type of cankers present. It is very important that the BHE differentiates between Butternut Cankers and mechanical damage or dark areas on the trunk caused by moisture. Moisture can cause darkening of the areas at the base of natural fissures in the bark. If unsure, the damage or darkness should not be assumed to be caused by Butternut Canker. Similarly, when a callus is observed, the BHE must only record the callus on the data collection form if it is clearly the result of Butternut Canker. The callus may have formed as a result of causes unrelated to Butternut Canker (e.g., mechanical damage).

3.4 Measuring Tree Stem Diameter

This section sets out how to measure the stem diameter of a Butternut tree. This section also provides guidance on how to assess Butternut trees with multiple stems and those that are shorter than 1.37 m in height.

3.4.1 Measuring Single-stemmed Butternut

For a Butternut tree with a single stem at the height of 1.37 m above ground level, the tree's stem diameter shall be determined from measurements taken at the height of 1.37 m.

3.4.2 Measuring and Assessing Butternut with Multiple Stems

Some Butternut trees have two or more stems at the height of 1.37 m above ground level. For a Butternut tree with multiple stems at this height, the BHE must first determine whether they are assessing a single tree or two or more trees that have grown close together. To do this, the BHE will observe whether the stems appear to have grown from one root, and whether they have the same bark type and crown vigour (taking into account any differences in exposure to sun). If there are any cankers, the BHE will observe whether there is similar cankering on each of the stems. If it is a single tree with multiple stems, the BHE should conduct the assessment on all live stems. If the stems are determined to belong to separate trees, the BHE shall assess each tree individually.

For a multi-stemmed tree where the fork is below the height of 1.37 m but 30 cm or more above the top of the root flare, the BHE shall record the diameter of the narrowest part of the main stem below the fork. If the tree divides into several stems within 30 cm of the top of the root flare, the diameter of the tree shall be determined by taking the square root of the sum of the squared diameter measurements, measured at the height of 1.37 m, of all stems.

The BHE will count all Butternut Cankers below the fork and on all stems above the fork. The Butternut Canker counts will be recorded on the data collection form as usual, according to the location of the cankers on the tree (i.e., root flare, below 2 m and above 2 m).

3.4.3 Measuring and Assessing Butternut that are Shorter than 1.37 m in Height

The BHE must apply the same assessment procedures to Butternut seedlings and saplings that are applied to older Butternut trees. The criteria for determining the tree's category are the same, but a BHE must make the following reporting modifications when assessing Butternut that are shorter than 1.37 m:

- **Tree stem diameter:** The stem diameter is to be measured at ground level and rounded to the nearest centimetre. The value recorded on the data collection form must be greater than zero.
- **Assess stem for canker:** The BHE will assess the stem for Butternut Canker from the root collar to the base of the crown and complete the applicable open/sooty canker count fields on the data collection form (i.e., only the "Root" and " ≤ 2 m" data fields). The BHE will need to enter zeros in the >2 m data fields because the tree is shorter than 2 m.
- **Main stem length below crown:** The BHE will measure the stem from the root collar to the base of the crown, round to the nearest metre and enter that value in the "main stem length below crown" field (to be entered as either "00" or "01"). This will clarify that the zeros in the >2 m open/sooty canker count fields were entered as such because of the height of the tree rather than the absence of cankers.

3.5 Assessment of Hybridization

Hybrids of Butternut and non-native Walnut trees are different species from Butternut, are not fully native to Ontario and are not protected under the ESA⁶. To determine if a tree is a putative hybrid, the BHE must use the Key for Field Identification of Butternut Hybrids, provided in Appendix A. If the BHE determines that the tree is a putative hybrid, the BHE should record the results of their examination in the Data Sheet for Field Identification of Butternut Hybrids (also in Appendix A). If the BHE remains uncertain about whether the tree being assessed is a hybrid after using the Key for Field Identification of Butternut Hybrids, the BHE should contact MECP for advice regarding genetic testing.

For illustrations of the traits used in hybrid identification refer to:

- Farlee, L., K. Woeste, M. Ostry, J. McKenna and S. Weeks. 2010. Identification of Butternuts and Butternut Hybrids. Purdue University Forestry and Natural Resources Extension. FNR-420-W.

For more information regarding hybrid identification refer to:

- Ross-Davis, A., Z. Huang, J. McKenna, M. Ostry, and K. Woeste. 2008. Morphological and molecular methods to identify butternut (*Juglans cinerea*) and butternut hybrids: relevance to butternut conservation. *Tree Physiology* 28: 1127–1133.

3.6 Assessment of Natural Occurrence

A Butternut that is naturally occurring is a tree that has established without human assistance. In most cases, the means by which a Butternut tree has become established is not known with certainty. Hence, the BHE must rely on the evidence available to judge whether it is more likely that the tree was cultivated or established naturally without human assistance.

A Butternut is presumed to be naturally occurring if:

- (i) it occurs in habitat typically occupied by naturally growing Butternut in Ontario; and
- (ii) there is insufficient evidence to reasonably support a determination that the tree was cultivated.

With respect to condition (i) above, Butternut trees naturally grow in a variety of treed and open habitats in Ontario. They occur along fencerows, within treed riparian zones, on the lower slopes of treed ravines, and in and around mixed deciduous woodlots and forests, where they grow beneath canopy openings, near forest edges and along forest roads. Trees occur on rich, moist, well-drained loams and on well-drained rocky soils, especially of limestone origin. Butternut trees growing in these situations should be presumed to be naturally occurring unless there is sufficient evidence available to support the determination that they have been cultivated.

6. Activities impacting hybrid trees may be subject to municipal by-laws and other legislation.

Regarding condition (ii) above, what constitutes sufficient evidence is circumstance dependent. Sufficient evidence may be documentation (such as a planting plan) produced for the lands in question that identifies Butternut as a species to be planted. A bill of sale for Butternut seedlings issued to the landowner and dated prior to the date of the health assessment may also be sufficient evidence that the Butternut trees on the landowner's property were cultivated, if their age corresponds with the elapsed time since the date on the bill of sale. In addition to these examples, there may be other forms of evidence to demonstrate that the tree was cultivated.

If a Butternut tree occurs in habitat not typically occupied by naturally growing Butternut in Ontario, it may be presumed to have been cultivated. For example, a Butternut tree growing in a manicured garden can usually be presumed to have been cultivated, unless it had established naturally prior to the site being developed.

3.7 Timing of Assessments

A complete and accurate assessment of a Butternut tree can only be conducted during the "leaf-on" season, subject to the circumstances set out below for conducting an assessment outside the "leaf-on" season. Leaf-on season begins with the flushing of leaves in the spring (late May/early June) and ends with leaf yellowing and leaf fall (August). Exact dates vary depending on the geographic location of the tree and seasonal variability from year to year. For the purposes of the ESA, an assessment will be considered to have been conducted during the leaf-on season if it was conducted between the dates of May 15 and August 31.

A BHE can conduct an assessment outside the leaf-on season, but the assessment would be limited to the extent of Butternut Canker on the main trunk (also referred to as the bole) because it would not be possible to assess the crown and it may not be possible to assess the root flare. Therefore, only trees that are assessed as Category 1 trees can be definitively categorized outside the leaf-on season, which can occur only if the number and type of Butternut Cankers on the main trunk result in a Category 1 classification (i.e., the total of the assigned canker widths for cankers observed on the main trunk would need to equal at least 40% of the main trunk circumference because the values entered for root flare cankers must be zero). Otherwise, the assessment cannot be completed until the next leaf-on season, because assessment of the crown could change the categorization. If the tree cannot be categorized, the BHE Report is incomplete and will not be considered valid.

In all circumstances, it is recommended that Butternut health assessments be conducted as close as possible to the date of the activity that will affect the Butternut trees. This is because the extent to which the trees are affected by Butternut Canker may change between the date of the assessment and the activity date, and because new Butternut seedlings may have grown since the date of the assessment.

3.8 Identification of Assessed Trees

The BHE must assign a unique identifier to each of the assessed trees (i.e., a number). Non-invasive methods of identifying Butternut are preferred. If paint is used, white paint is recommended because other colours have specific meanings in tree marking programs. Tree numbering will ensure trees are correctly identified during future activities (e.g., digging, pruning, tree removal).

4. Butternut Health Expert (BHE) Reports

4.1 Reporting Tools

When conducting Butternut health assessments for the purposes of the ESA, the BHE must use the following reporting tools for recording data, analyzing results and producing the BHE Report:

- a) Butternut Data Collection Form
- b) BHE Report Template.

These reporting tools are available in the **Ontario Central Forms Repository** or by emailing **SARontario@ontario.ca**. BHEs should use the most up to date versions because these tools may be amended.

4.2 Categorization of Assessed Trees

The data collection form will use the data entered by the BHE to calculate the appropriate category assignment for each assessed tree.

4.3 Contents of BHE Reports

A BHE Report produced for the purposes of the ESA must contain the following information:

- a) BHE name and contact information
- b) Summary of the BHE's qualifications that pertain to the definition of "butternut health expert" in O. Reg. 830/21
- c) Client name and contact information
- d) Location of the property where the tree(s) are located
- e) BHE Report number (assigned by the BHE using the format specified in the BHE Report template)
- f) Map datum used (NAD 83 or WGS 84)
- g) Date(s) of the assessment
- h) Total number of trees assessed (including Butternut and hybrids)

- i) A summary of the results for each Butternut tree (presented in line with each tree's assigned identification number), as follows:
 - the tree's precise location (UTM coordinates)
 - the category to which the tree was assigned (1, 2 or 3)
 - the tree's stem diameter
 - whether the tree stem is shorter than 1.37 m
 - whether the tree was cultivated
 - whether the tree is proposed to be killed, harmed, or taken, if known to the BHE
 - the reason the tree is proposed to be killed, harmed, or taken, if known to the BHE
- j) The total number of trees in each category.

An appendix to the BHE Report must include the completed data collection form. The BHE should keep a copy for their records.

The following information should be included in an appendix to the BHE Report, as appropriate:

- k) additional documentation or evidence to support the assessment (e.g., completed Data Sheets for Field Identification of Butternut Hybrids, evidence that the Butternut was cultivated)
- l) relevant documentation provided to the BHE by the client (e.g., a bill of sale for Butternut seedlings, or the permit number or registration confirmation number if the Butternut was cultivated to satisfy an ESA permit requirement or to satisfy a condition of an exemption under O. Reg. 830/21 or O. Reg. 242/08)
- m) all relevant maps and photographs.

The BHE is to submit the BHE Report to the person who requested the health assessment (for example, the property owner). A person who intends to undertake actions that will impact one or more Butternut trees is required to submit the BHE Report to MECP if they wish to register under the conditional exemption for Butternut in ss. 25 (2) of O. Reg. 830/21. If the proposed actions are not eligible for the conditional exemption, a person may seek an authorization of these actions under a permit or agreement issued under the ESA.

Even if all of the Butternut assessed by the BHE were determined to be putative hybrids, the BHE is still advised to prepare a BHE Report for the assessed trees and provide it to their client. While hybrid Butternut trees are not currently protected under the ESA, actions impacting these trees may be subject to municipal by-laws and other legislation.

Butternut trees identified as cultivated in the BHE Report may have been cultivated to satisfy the requirements of a permit or agreement under the ESA or an exemption under O. Reg. 830/21 or O. Reg. 242/08 (as it read immediately before December 9, 2021). The owner or occupier of the land (or person acting on their behalf) will need to determine whether they are eligible for ss. 25 (5) of O. Reg. 830/21 prior to undertaking any action that may kill, harm, or take any of these Butternut trees.

The BHE Report template includes a cover letter for the BHE's client which explains that the BHE Report (and its appendices) must be submitted to MECP a minimum of 30 days before registering an eligible activity under ss. 25 (2) of O. Reg. 830/21. During this 30-day period, no Butternut trees (of any category) may be killed, harmed, or taken.

4.4 Examination of Assessed Trees

MECP may request permission to examine any assessed trees that are included in a BHE Report that was submitted to MECP within the 30-day period that follows the submission of the BHE Report to MECP.

The purpose of examination is to determine whether the assessment was conducted in accordance with this document. MECP would contact the person who submitted the BHE Report to request permission to enter the property to examine the trees. The BHE who conducted the assessment may also be notified that the assessed tree(s) will be examined. The results of the examination may affect the person's eligibility for conditional exemptions under O. Reg. 830/21.

The cover letter template has been written to advise the client that MECP may request permission to enter the property for the purpose of examining the assessed trees during the 30 day period that follows submission of the report to MECP and that to be compliant with the regulation, they must give permission for MECP employee(s) to enter the property to examine the trees during that timeframe. Web-links are provided to direct the client to further information on how to register an eligible activity.

5. References

5.1 Legal References

Endangered Species Act, 2007

Ontario Regulation 242/08 (General Regulation)

Ontario Regulation 830/21 (Exemptions – Barn Swallow, Bobolink, Eastern Meadowlark and Butternut)

Ontario Regulation 829/21 (Species Conservation Charges)

Ontario Regulation 230/08 (Species at Risk in Ontario List)

5.2 Technical References

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Appendix A: Guidance for Field Identification of Butternut Hybrids

The protections provided under section 9 of the *Endangered Species Act, 2007* (ESA) can apply to species, subspecies, varieties or genetically or geographically distinct populations that are native to Ontario, as identified in the **Species at Risk in Ontario (SARO) List** in O. Reg. 230/08. The species Butternut (*Juglans cinerea*) is identified on the SARO List as endangered, and consequently trees belonging to this species are protected under the ESA. Trees that result from the first-generation hybridization of Butternut and other Walnut species, or from the breeding of these or later-generation hybrids, are not considered to be Butternuts. Therefore, they are not protected under the ESA. Hybrid trees are relatively abundant in parts of southern Ontario, especially in settled areas, so the Butternut Health Expert (BHE) must know how to differentiate them from Butternuts.

Butternut is known to hybridize with Persian Walnut (*Juglans regia* L.) and, more commonly, with Japanese Walnut (*J. ailantifolia* Carrière). Hybrids of Butternut and Persian Walnut are known as *J. x quadrangulata* and are not common. In contrast, across a large part of the Butternut's American range, hybrids have been found between Butternut and a variety of the Japanese Walnut known as Heartnut (*J. ailantifolia* var. *cordiformis*). First-generation hybrids are called Buartnuts (*J. x bixbyi*). Buartnuts are highly productive and able to cross pollinate with other Buartnuts and trees of both parent species. They may even self-pollinate.

Differentiating between Butternut, Heartnut, Buartnut and the second-or-more-generation hybrid progeny of Buartnuts can be difficult. In some instances, only genetic testing can definitively assign a tree to one of these lineages. Regardless, the following key provides guidance for the purpose of field identification. To use the key, the BHE should examine the tree for at least five of the traits listed below and assign a score of 0, 1, or 2 based on their observations, using the scoring system provided in the last column (right side). The BHE will sum the scores for each of the traits examined to determine whether the tree is a Butternut or a putative hybrid. If the total score for the tree is 3 or less, it is probably a Butternut. If it is greater than 3, it is probably a hybrid⁷. A blank data sheet is provided for recording observations. If genetic testing is required to confirm whether a tree is a Butternut or Butternut hybrid, contact MECP for procedural guidance.

7. Illustrations of the traits mentioned in this key can be found in Farlee, L., K. Woeste, M. Ostry, J. McKenna and S. Weeks. 2010. Identification of s and Butternut Hybrids. Purdue University Forestry and Natural Resources Extension. FNR-420-W.

Key for Field Identification of Butternut Hybrids

Trait	Description	Assign score of:
Leaf retention	Leaves yellow and drop early in the fall, late August to mid-September	0
	Leaves yellow and drop in mid-fall, after the first frost	1
	Leaves stay green late into the fall and drop after a hard frost	2
Dormant terminal bud	Terminal bud elongated and slender, conical, and tan-coloured	0
	Terminal bud broadest at base, less elongated, slightly green coloured	1
	Terminal bud stout, pyramid shaped, green or yellow green in colour	2
Dormant twigs	Dark olive green or reddish-brown, slender, sometimes with hairs below the terminal bud	0
	Tan to brownish green and stout, sometimes with patches of hairs, especially below terminal bud	1
	Tan to light green, stout, often with abundant rusty red or tan hairs	2
Lenticel shape on new twigs	Lenticels on most recent growth uniformly small, round, white, abundant, and evenly distributed; if some are elongated or dash-shaped, elongation is perpendicular to direction of the branch	0
	Lenticels on most recent growth mostly small, round, white, abundant, with patchy distribution; if some are elongated or dash-shaped, elongation is parallel to direction of branch	1
	Lenticels on most recent growth large, tan and corky, patchy distribution, many dash-shaped and elongated parallel to branch	2
Pith colour of 1-year twig	Very dark, chocolate brown	0
	Medium brown (colour of dark maple syrup)	1
	Tan to honey coloured	2

Trait	Description	Assign score of:
Leaf scar	Top edge of most leaf scars straight or slightly arched	0
	Top edge of some leaf scars with small descending "V" shaped notch	1
	Top edge of most or all leaf scars with clear descending "V" shaped notch	2
Leaf length	Most leaves less than 46 cm long	0
	Many leaves 46 cm or longer	1
Colour of bark fissures on mature trees	Dark grey or black	0
	Light grey or silvery	1
	Tan or slightly pinkish	2
Green hull characteristics	Densely hairy and very sticky	0
	Somewhat hairy and only slightly sticky	2
Nut shape	Nut cylindrical, round in cross section, with thin, sharp corrugations; the suture/seam is not easily distinguished from the longitudinal ridges	0
	Nut slightly asymmetrical, with noticeable valleys between longitudinal ridges	1
	Nut asymmetric, diamond shaped or flattened, with dull or sparse corrugations; the suture/seam is easily identified and forms the widest part of the body of the nut	2
Catkin length when fully extended and shedding pollen	Shorter than 11.5 cm	0
	11.5 – 14 cm	1
	Longer than 14 cm	2

Data Sheet for Field identification of Butternut Hybrids

BHE name:						
BHE Report #:		Tree ID #:	Tree ID #:	Tree ID #:	Tree ID #:	Tree ID #:
Assessment Date(s):		_____	_____	_____	_____	_____
Tree location (site address):						
Client name:						
Traits (evaluate at least five traits)		Scores assigned:	Scores assigned:	Scores assigned:	Scores assigned:	Scores assigned:
Leaf retention						
Dormant terminal bud						
Dormant twigs						
Lenticel shape on new twigs						
Pith colour of 1-year twig						
Leaf scar						
Leaf length						
Colour of bark fissures on mature trees						
Green hull characteristics						
Nut shape						
Catkin length when fully extended and shedding pollen						
Total score: <i>How to interpret total score:</i> <i>0 to 3 = Butternut</i> <i>4 or greater = Hybrid</i>						